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M E M O R A N D U M

TO: John Mitnik, Assistant Executive Director, Executive Office Staff

FROM: SFWMD Staff Environmental Advisory Team

DATE: October 6, 2021

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Relatively dry air remains in place over the District which is expected to limit daily shower development. Daytime heating may still generate some scattered showers and a couple of thunderstorms over the interior and west. A cold front is forecast to push into the District Saturday before stalling and becoming diffuse. Increasing moisture ahead of this boundary is expected to result in increased thunderstorm activity over the District, particularly Friday and Saturday. Activity is forecast to be focused over the interior and west Thursday, over the northern half of the District Friday, and then across the central portion of the District Saturday. The diffuse frontal boundary and lingering moisture over the area should help daily shower activity develop over the southern interior with daytime heating Sunday and Monday. Total rainfall is forecast to be above the historical average during the first 7-day period (Week 1). During the second 7-day period (Week 2), total rainfall is forecast to be near the historical average over southeastern areas and below average over the remainder of the District.

Kissimmee

Flow at S-65A continues to be too low for complete inundation of the Kissimmee River floodplain; mean floodplain water depth decreased to 1.24 feet by October 3, 2021. The concentration of dissolved oxygen in the Kissimmee River has been improving, with the station average rising to 1.3 mg/L on October 3, 2021.

Lake Okeechobee

Lake Okeechobee stage was 15.59 feet NGVD on October 3, 2021 and it was 0.89 feet higher than a month ago (**Figure LO-1**). Lake stages have been above or at the very top of the ecological envelope for all of 2021, and currently 0.3 ft above (**Figure LO-2**). There have been essentially no outflows from the lake since late June 2021. Recent satellite imagery (October 2, 2021) showed medium bloom potential in the western part of the Lake (**Figure LO-6**).

Estuaries

Total inflow to the St. Lucie Estuary averaged approximately 980 cfs over the past week with no flow coming from Lake Okeechobee. Mean surface salinities increased at all sites in the estuary over the past week. Salinity at the US1 Bridge was in the fair range (10-26) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 5,157 cfs over the past week with no flow coming from the Lake. Mean surface salinities remained the same at S-79, Val I-75, and Fort Myers, and increased at the remaining sites in the estuary over the past week. Salinities were in the good range (0-10) for tape grass at Val I-75 and Ft. Myers. Salinities were also in the good range (10-30) for adult eastern oysters at Sanibel and Shell Point and in the poor range at Cape Coral.

Stormwater Treatment Areas

For the week ending Sunday, October 3, 2021, no Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2022 (since May 1, 2021) is approximately 61,000 ac-feet. The total amount of inflows to the STAs in WY2022 is approximately 796,000 ac-feet. Most STA cells are near target stage, except STA-3/4 EAV cells that are above target stage. STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7, STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown, and STA-2 Flow-way 2 is offline for construction activities. Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways for construction activities. Operational restrictions are in effect in STA-1E Central Flow-way and STA-2 Flow-ways 3 and 4 for vegetation management activities. Operational restrictions are also in effect in STA-5/6 Flow-ways 2 and 3 following the Restoration Strategies project to grade non-effective treatment areas. This week, if 2008 LORS recommends Lake releases to the WCAs and conditions allow, releases will be sent to STA-2.

Everglades

Rehydration rates were generally fair to good across the Everglades. Depths in WCA-3A South fell below the tree island flooding threshold. In Florida Bay salinities remain unchanged from the week previous and stages decreased in Taylor Slough on average. Central and Western Florida Bay increased to above the 75th percentile of the historical average for this time, and Florida Bay remains marine and above average.

SUPPORTING INFORMATION

Kissimmee Basin

Upper Kissimmee

On October 3, 2021 lake stages were 57.0 feet NGVD (0.1 feet below schedule) in East Lake Toho, 54.0 feet NGVD (0.1 feet below schedule) in Lake Toho, and 51.5 feet NGVD (0.1 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1, Figures KB-1-3**).

Lower Kissimmee

Discharges to the Kissimmee River on October 3, 2021 were 1,370 cfs at S-65 and 1,410 cfs at S-65A; discharges from the Kissimmee River were 2,480 cfs at S-65D and 2,630 cfs at S-65E (**Table KB-2**). Headwater stages were 46.2 feet NGVD at S-65A and 28.5 feet NGVD at S-65D on October 3, 2021. With lower water temperatures and reduced discharge at S-65A, the concentration of dissolved oxygen in the Kissimmee River has been improving, with the station average rising to 1.3 mg/L on October 3, 2021 (**Table KB-2, Figure KB-4**); the daily average on October 4 in the Phase I area has risen above 2 mg/L. Flow at S-65A remains too low for complete inundation of the Kissimmee River floodplain, and mean floodplain depth decreased to 1.24 feet by October 3, 2021 (**Figure KB-5**).

Water Management Recommendations

Maintain at least 1,400 cfs at S65/S65A per the IS-14-50 discharge plan.

Table KB-1. Average discharge for the preceding seven days and Sunday's average daily stage and departures from KCL flood regulation or temporary schedules. All data are provisional.

Water Body	Structure	Stage Monitoring Site	7-Day Average Discharge (cfs)	Lake Stage (feet NGVD) ^a	Schedule Type ^b	Schedule Stage (feet NGVD)	Departure from Regulation (feet)	
							10/3/21	9/26/21
Lakes Hart and Mary Jane	S-62	LKMJ	200	60.1	R	60.1	0.0	0.4
Lakes Myrtle, Preston and Joel	S-57	S-57	102	61.1	R	61.1	0.0	0.6
Alligator Chain	S-60	ALLI	121	63.3	R	63.3	0.0	0.0
Lake Gentry	S-63	LKGT	152	61.1	R	61.0	0.1	0.0
East Lake Toho	S-59	TOHOE	431	57.0	R	57.1	-0.1	0.3
Lake Toho	S-61	TOHOW S-61	474	54.0	R	54.1	-0.1	0.0
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	1,337	51.5	R	51.6	-0.1	0.3

a. Names of in-lake monitoring sites and structures used to determine lake stage. If more than one site is listed, an average is reported.

b. A: projected recession line; R: USACE regulation schedule; S: temporary recession target line; T: temporary schedule; NA: not applicable or not available.

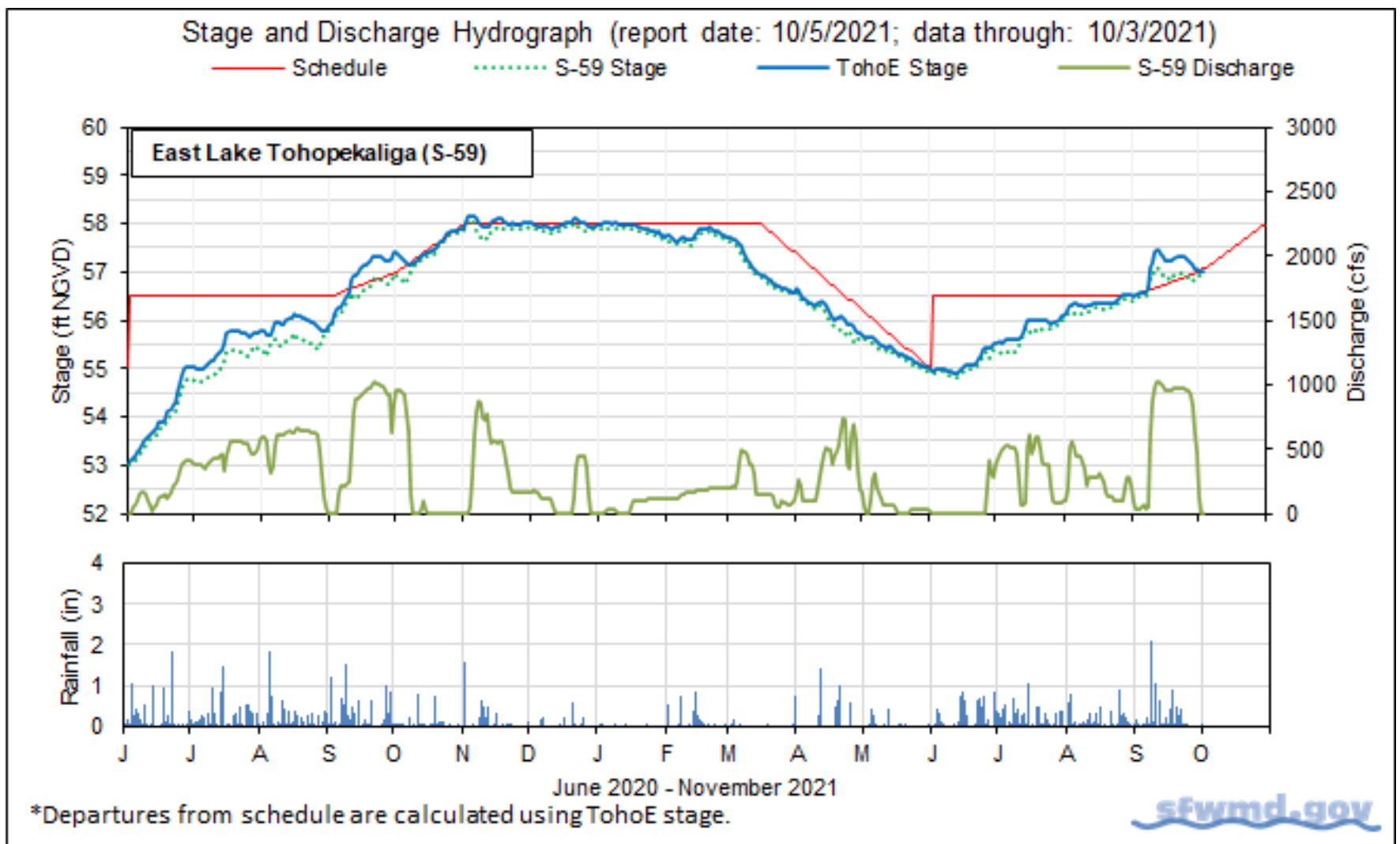


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

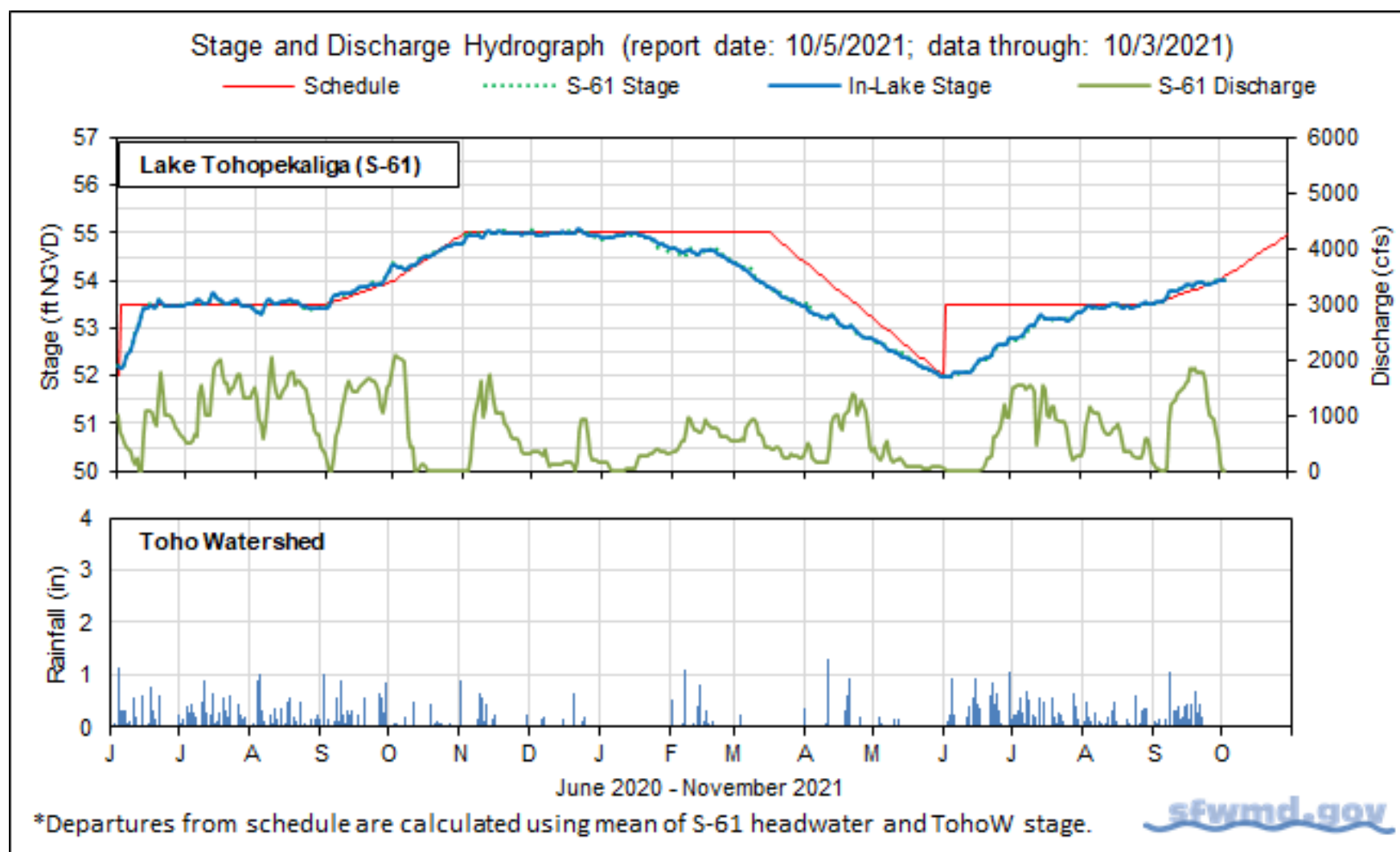


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

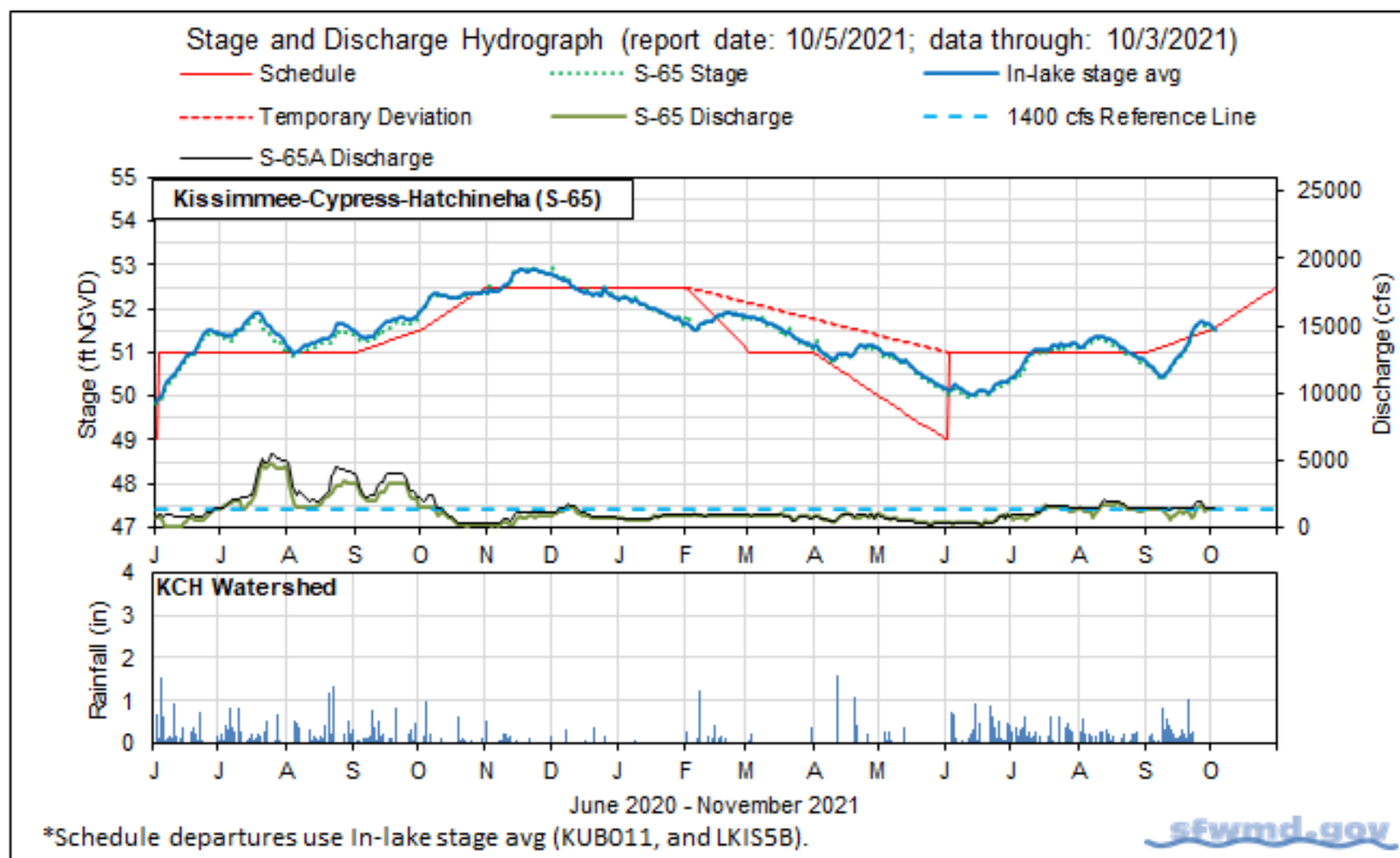


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

Table KB-2. One- and seven-day average discharge and stage at Lower Kissimmee basin structures, river channel dissolved oxygen concentrations and water depths in the Phase I area floodplain. All data are provisional.

Metric	Location	Daily Average 10/3/21	Average for Previous Seven Day Periods			
			10/3/21	9/26/21	9/19/21	9/12/21
Discharge	S-65	1,370	1,340	1,170	1,020	1,110
Discharge	S-65A ^a	1,410	1,500	1,650	1,420	1,400
Headwater Stage (feet NGVD)	S-65A	46.2	46.2	46.4	46.3	46.5
Discharge	S-65D ^b	2,480	2,880	2,650	1,680	1,570
Headwater Stage (feet NGVD)	S-65D ^c	28.5	28.6	28.7	28.5	28.4
Discharge (cfs)	S-65E ^d	2,630	3,010	2,870	1,730	1,640
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) ^e	Phase I, II/III river channel	1.3	0.9	0.8	0.8	2.2
Mean depth (feet) ^f	Phase I floodplain	1.24	1.40	1.52	1.21	0.94

a. Combined discharge from main and auxiliary structures.

b. Combined discharge from S-65D, S-65DX1 and S-65DX2.

c. Average stage from S-65D and S-65DX1.

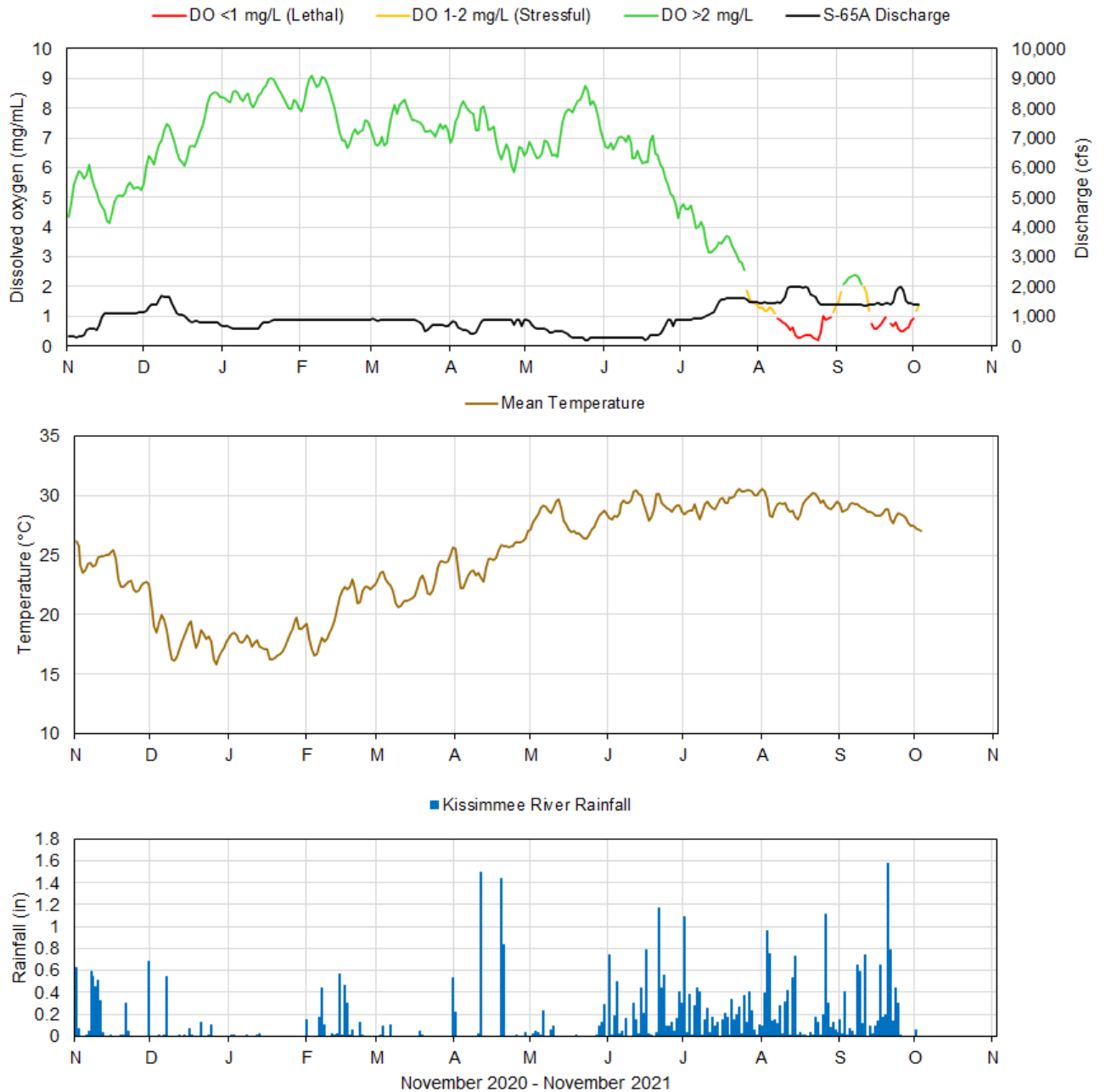
d. Combined discharge from S-65E and S-65EX1.

e. Dissolved oxygen is the average of values from sondes KRBN, PC62, PC63, PD62R and PD42R.

f. One-day spatial average obtained from the South Florida Water Depth Assessment Tool (SFWDAT).

Table KB-3. Discharge rate of change limits for S65/S-65A (revised 1/14/19).

Discharge (cfs)	Maximum Rate of Increase (cfs/day)	Maximum Rate of Decrease (cfs/day)
0-300	100	-50
301-650	150	-75
651-1,400	300	-150
1,401-3,000	600	-600
>3,000	1,000	-2,000



Report Date: 10/5/2021; data are through: 10/3/2021

sfwmd.gov

Figure KB-4. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRBN, PC33, PD62R, and PD42R with an average of four stations reporting this week. Rainfall values are daily totals for Kissimmee River (Pool BCD) AHED watershed.

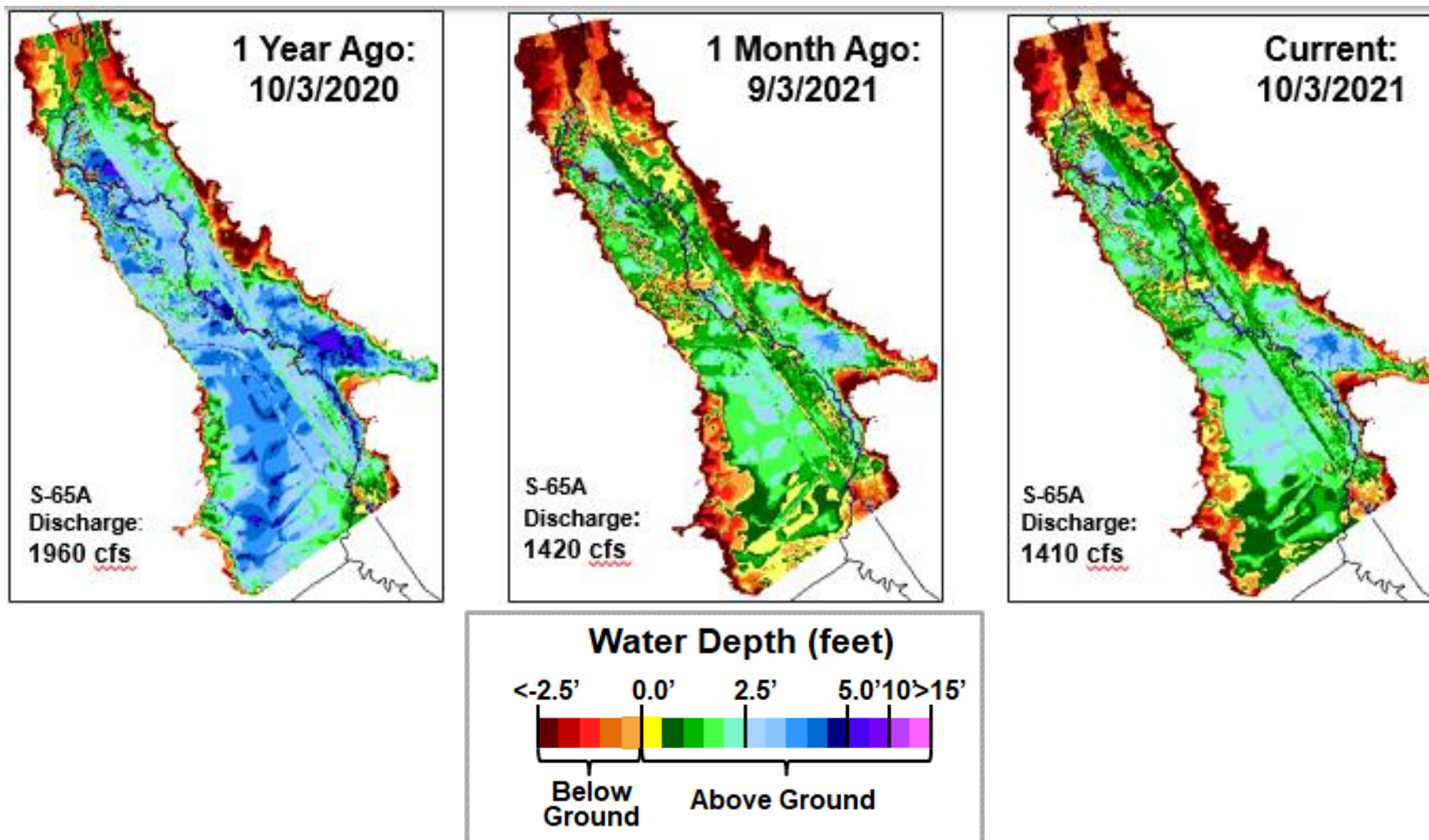


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

Lake Okeechobee

Lake Okeechobee stage was 15.59 feet NGVD on October 3, 2021 and it was 0.89 feet higher than a month ago (**Figure LO-1**). Lake stage is currently 0.3 ft above the ecological envelope, having been either above or at the very top of the envelope for all of 2021 (**Figure LO-2**). Lake stage remained in the Low sub-band last week (**Figure LO-3**). According to NEXRAD, 0.02 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) decreased from the previous week, going from 10,312 cubic feet per second (cfs) to 7,708 cfs. Average daily outflows (excluding evapotranspiration) remained 0 cfs. There have been essentially no outflows from the Lake since late June 2021. Most of the inflows (3,009 cfs) came from the Kissimmee River through S-65E & S-65EX1 structures. The second and third highest inflows were received from the Indian Prairie basins (2,644 cfs) and Fisheating Creek (1,506 cfs), respectively. There was no outflow to the west via S-77, to the east via S-308 or to the south via S-351, S-352 and S-354 structures. There was backflow from L-8 canal via the S-271 structure at the average daily rate of 79 cfs. **Figures LO-4 and LO-5** show the combined average daily inflows and outflows for the Lake over the past eight weeks, and average inflows and outflows last week, respectively. These data are provisional and are subject to change.

The most recent satellite image (October 2, 2021) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor data showed medium bloom potential in the western part of the Lake (**Figure LO-6**).

In late September, approximately 90% of the samples had microcystin concentration above detection limit and ~6% had above the EPA recommended threshold for recreational waters (8 µg/L). The highest concentration was 22 µg/L, recorded at the L006 site. Approximately 56% of the sites were dominated by *Microcystis aeruginosa*, while remaining sites had *C. raciborskii*, *P. limnetica*, or mixed communities. Phytoplankton biomass (chl a) results are pending. The September 20 - 21, 2021 survey results are shown in **Table LO-1** and **Figure LO-7**.

Current:
10/03/2021

1 Month Ago:
09/03/2021

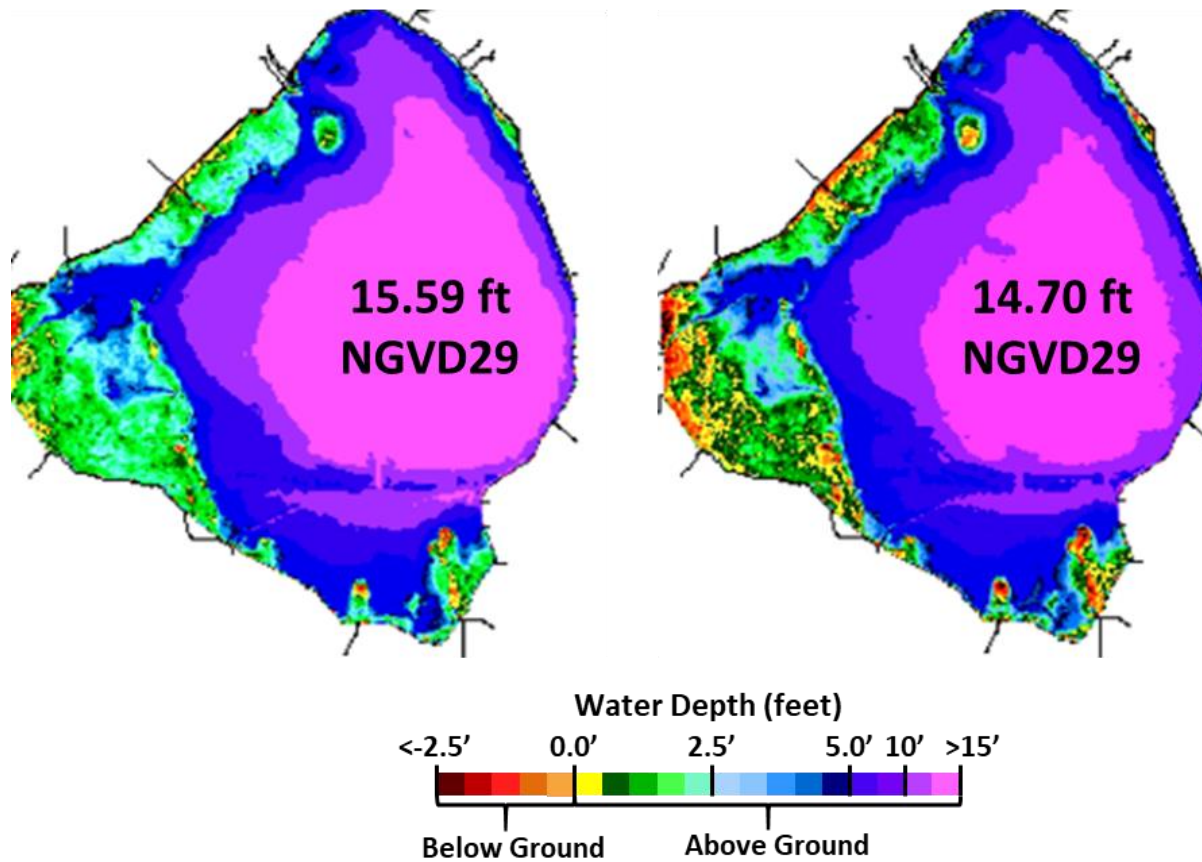


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

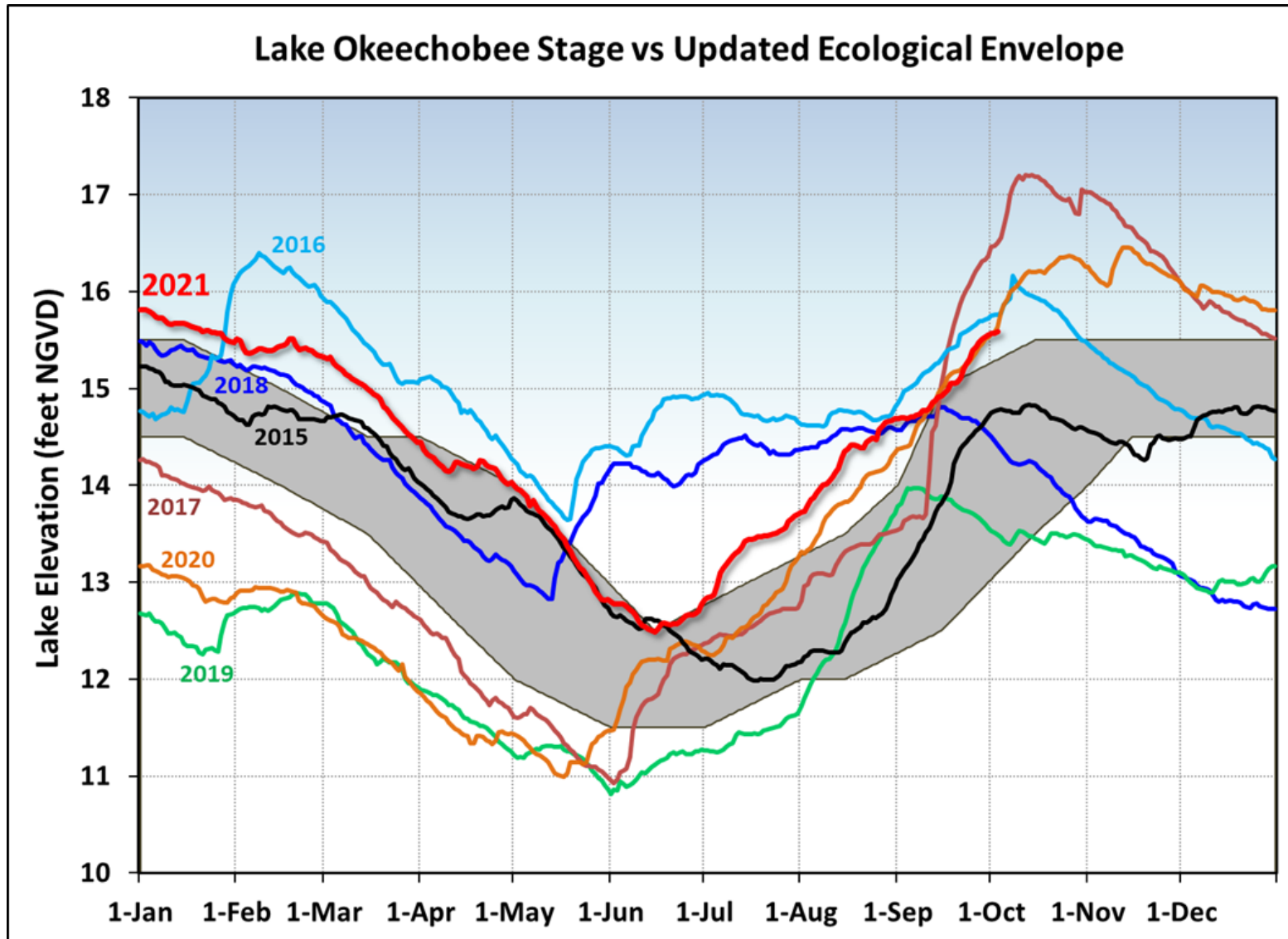


Figure LO-2. Select annual stage hydrographs for Lake Okeechobee in comparison to the updated ecological envelope.

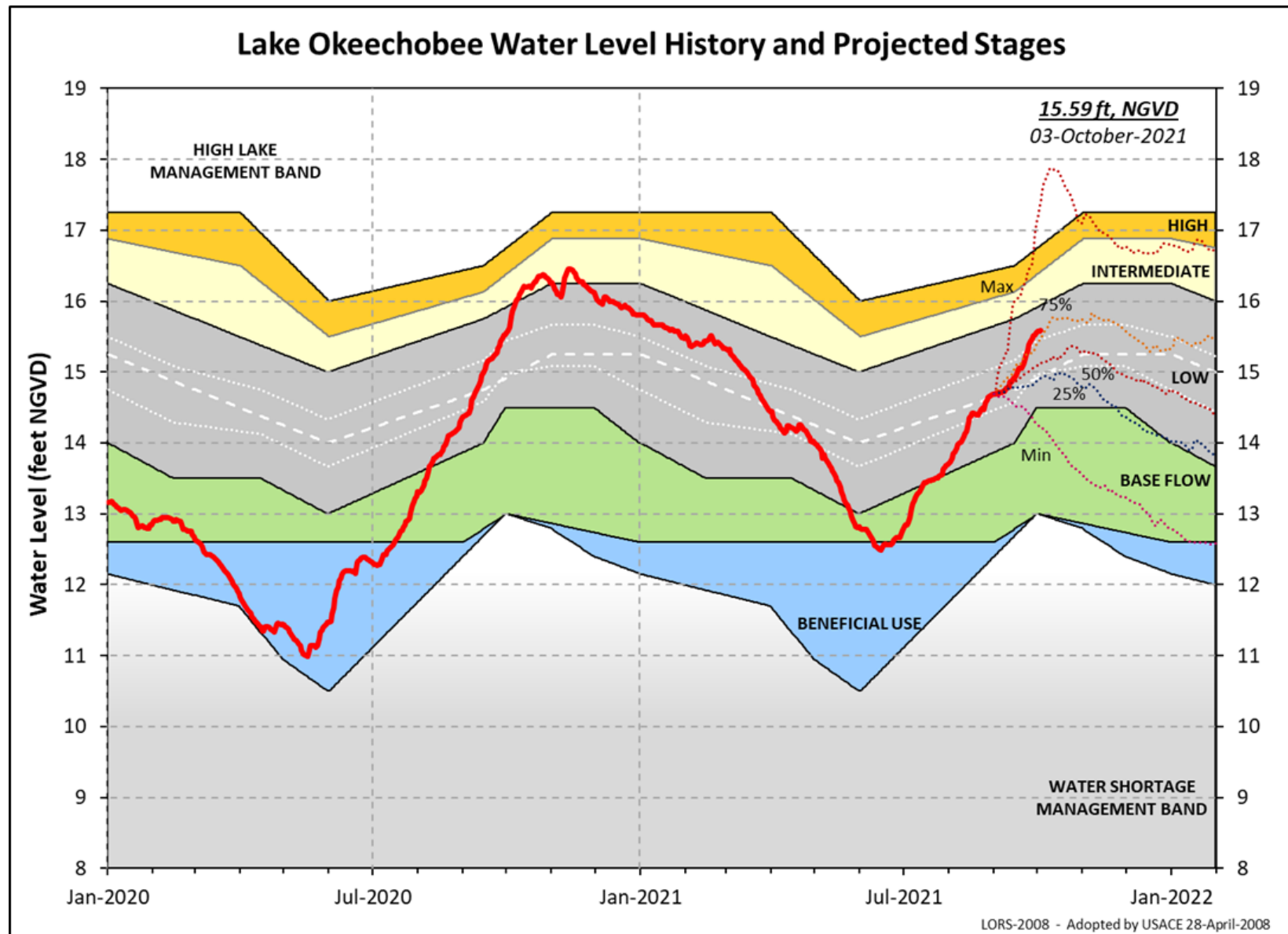


Figure LO-3. Recent Lake Okeechobee stages and releases, with projected stages based on a dynamic position analysis.

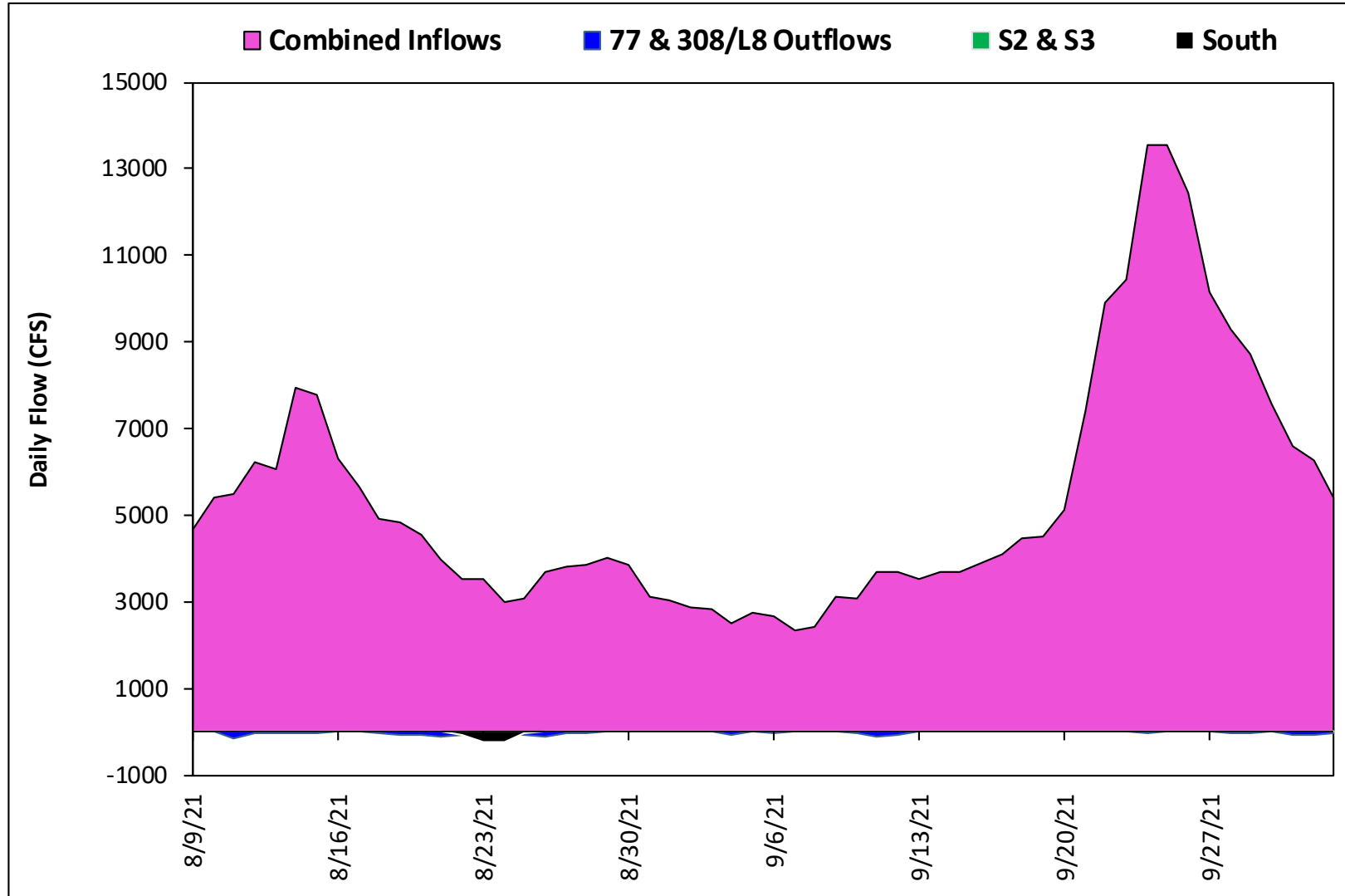


Figure LO-4. Major inflows (pink) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in gray. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from Lake Okeechobee into the L-8 or C-44 canals are included with outflows. Inflows are shown as positive values; outflows are negative. Outflows through the S-77 (Caloosahatchee) and S-308 (C-44 Canal) structures are based on downstream gauges to include flows to lock openings for navigation.

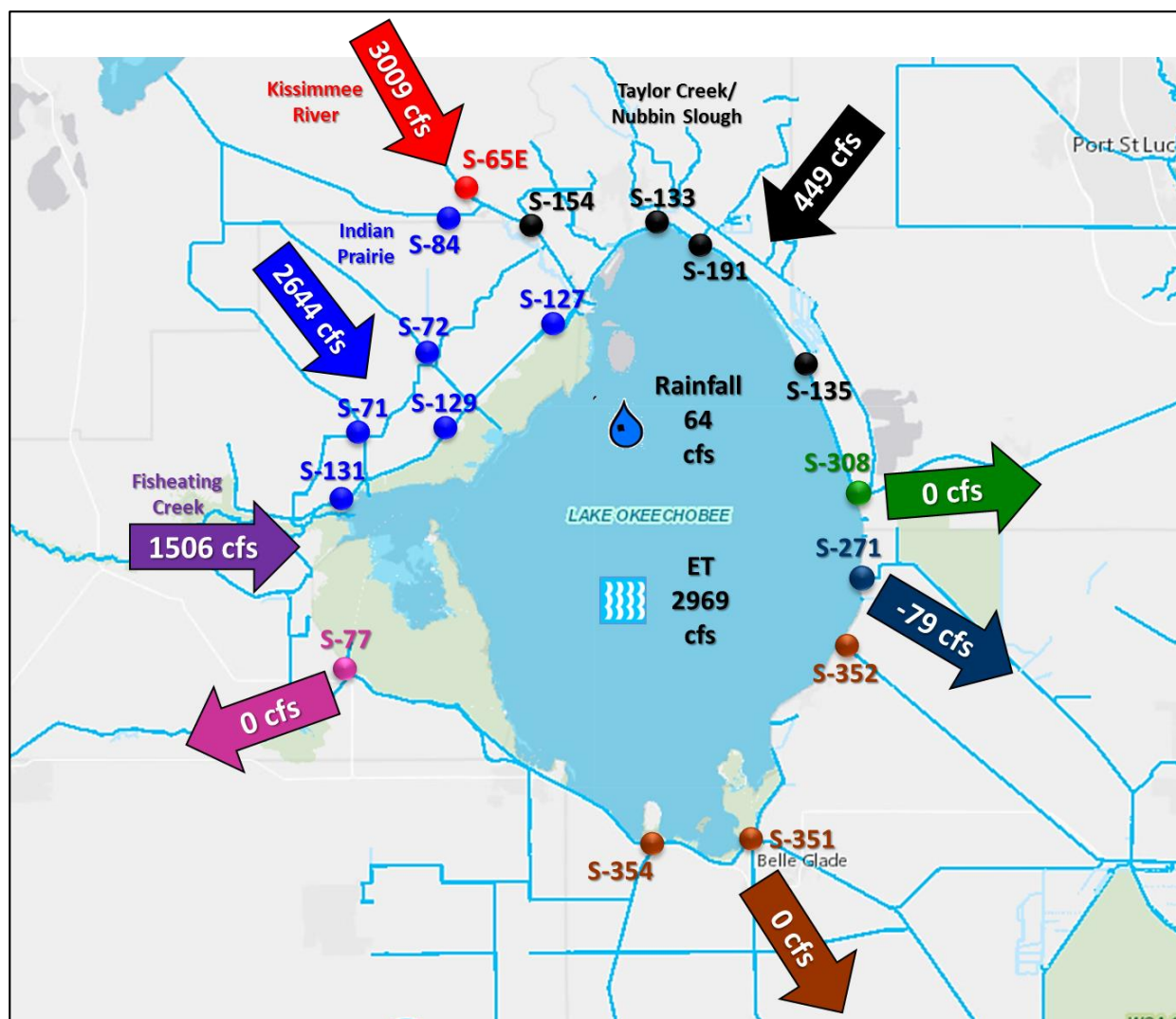


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to SW via S-271 (formerly Culvert 10A).

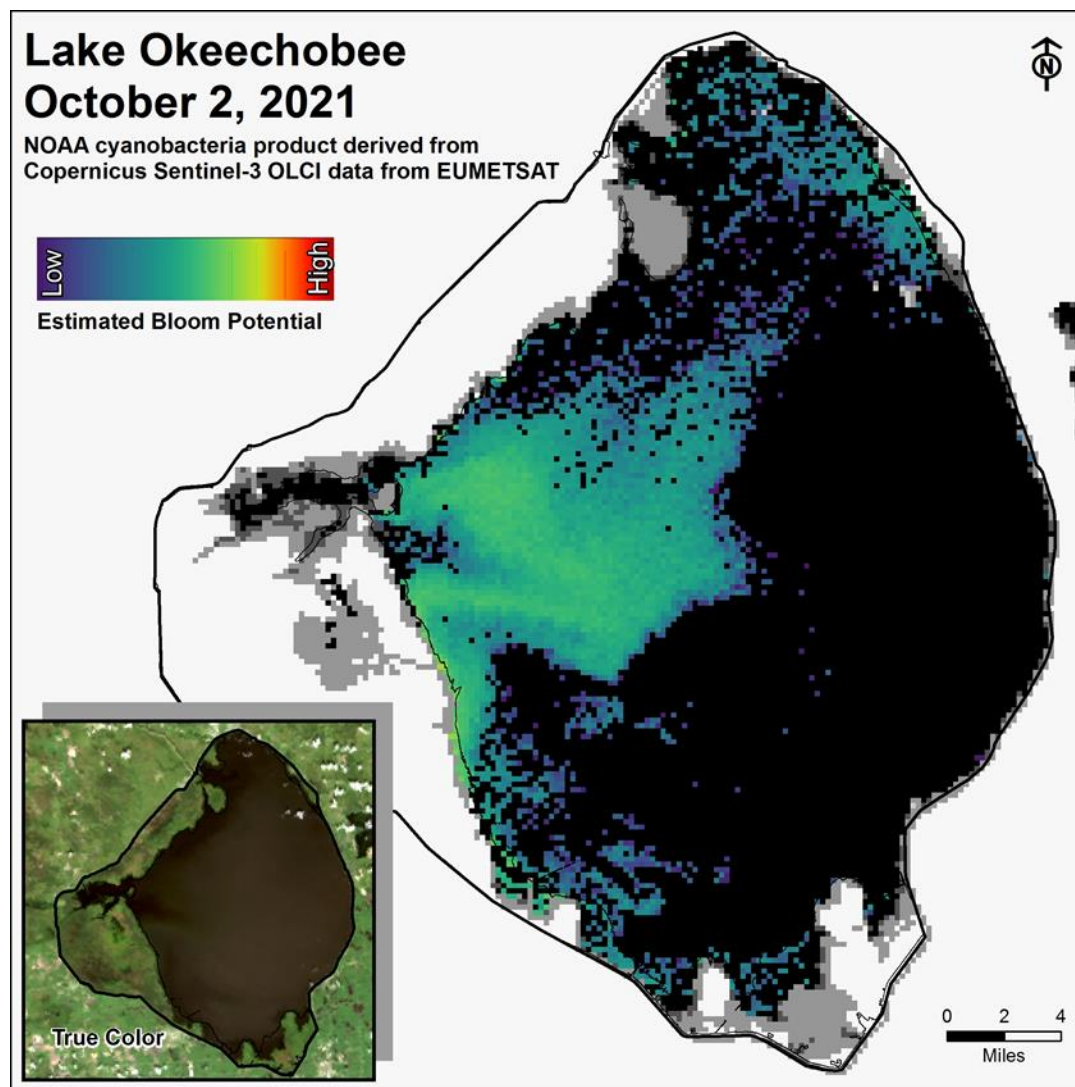


Figure LO-6. Cyanobacteria bloom potential on October 2nd, 2021 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

Table LO-1. Provisional results of chlorophyll *a* concentrations and cyanobacteria taxa from sampling trips on September 20 - 21, 2021. Color coding generally follows the legend in **Figure LO-6**.

Collection Date: September 20 - 21, 2021

Station	CHLa (ug/L)	TOXIN (ug/L)	TAXA
FEBIN	NS	NS	NS
FEBOUT	NS	NS	NS
KISSR0.0	21.1	0.3	<i>Microcys</i>
L005	52.9	0.6	<i>Cylin/Plank</i>
LZ2	64.7	0.4	<i>Microcys</i>
KBARSE	33.4	0.4	<i>Planktol</i>
RITTAE2	P	0.5	<i>mixed</i>
PELBAY3	P	0.4	<i>mixed</i>
POLE3S	P	0.6	<i>Microcys</i>
LZ25A	P	0.8	<i>Microcys</i>
PALMOUT	P	0.4	<i>mixed</i>
PALMOUT1	P	0.7	<i>Microcys</i>
PALMOUT2	P	2.9	<i>Microcys</i>
PALMOUT3	P	2.2	<i>Microcys</i>
POLESOUT	66.0	0.7	<i>Cylin/Plank</i>
POLESOUT1	69.4	0.7	<i>Cylin/Plank</i>
POLESOUT2	45.7	0.5	<i>Planktol</i>
POLESOUT3	45.1	0.6	<i>Planktol</i>
EASTSHORE	17.3	0.5	<i>mixed</i>
NES135	30.7	0.6	<i>Microcys</i>
NES191	57.3	0.5	<i>Microcys</i>

Station	CHLa (ug/L)	TOXIN (ug/L)	TAXA
L001	26.0	0.3	<i>Microcys</i>
L004	10.1	1.4	<i>Microcys</i>
L006	P	22.0	<i>Microcys</i>
L007	P	0.8	<i>Microcys</i>
L008	52.2	0.8	<i>Cylin/Plank</i>
LZ30	P	3.4	<i>Microcys</i>
LZ40	P	13.0	<i>Microcys</i>
CLV10A	P	BDL	<i>Microcys</i>
NCENTER	19.3	0.4	<i>Microcys</i>

S308C	11.8	BDL	<i>Microcys</i>
S77	0.7	BDL	<i>mixed</i>

- SFWMD considers >40 µg/L Chlorophyll *a* (Chla) an algal bloom
- BDL – Below Detectable Limit of 0.25 µg/L
- ND – No Dominant taxa
- P – Pending
- NS – Not Sampled
- Station bold font – crew observed possible BGA
- Chlorophyll *a* analyzed by SFWMD
- Toxin and Taxa analyzed by FDEP:
Microcys = *Microcystis*; *Cylindro* = *Cylindrospermopsis*; *Planktol* = *Planktolyngbya*;
Dolicho = *Dolichospermum*

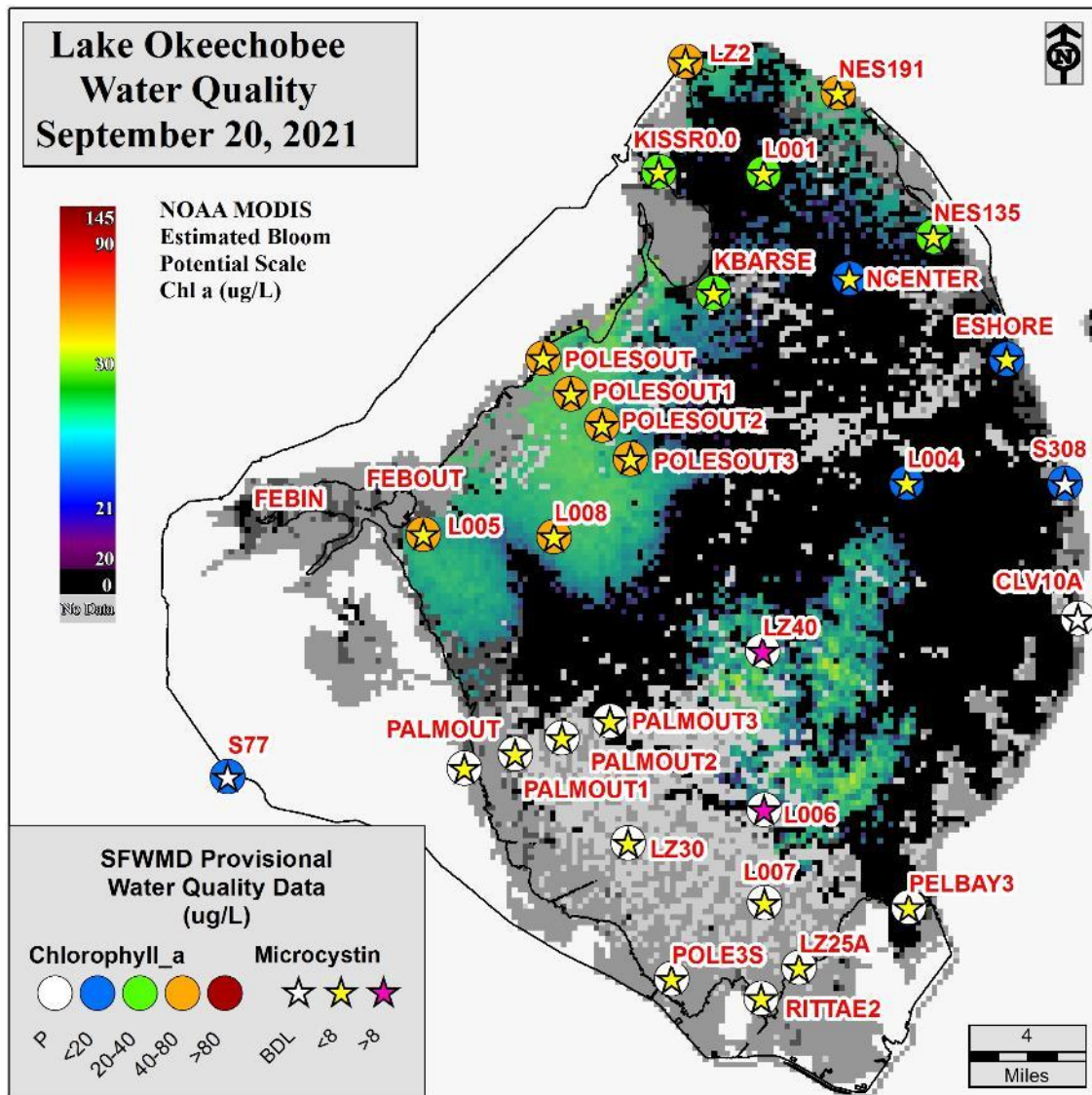


Figure LO-7. Expanded monitoring network and provisional results from samples collected September 20 - 21, 2021.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was approximately 980 cfs (**Figures ES-1 and ES-2**) and the previous 30-day mean inflow was approximately 2,071 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, surface salinities increased at all sites in the estuary (**Table ES-1 and Figure ES-3**). The seven-day moving average of the surface and bottom salinities at the US1 Bridge was 8.2. Salinity conditions in the middle estuary were estimated to be within the fair range for adult eastern oysters (**Figure ES-4**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was approximately 5,157 cfs (**Figures ES-5 and ES-6**) and the previous 30-day mean inflow was approximately 5,928 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-6**.

Over the past week, surface salinities remained the same at S-79, Val I-75, and Fort Myers, and increased at the remaining sites in the estuary (**Table ES-2 and Figures ES-7 and ES-8**). The seven-day mean surface salinities (**Table ES-2**) were in the good range (0-10) for tape grass at Val I-75 and at Ft. Myers. The seven-day mean surface salinity values were within the good range for adult eastern oysters at Shell Point and Sanibel, and in the poor range at Cape Coral (**Figure ES-9**).

Surface salinity at Val I-75 was forecasted for the next two weeks, using an autoregression model (Qiu and Wan, 2013¹) coupled with a linear reservoir model for the tidal basin. Model scenarios included pulse releases at S-79 ranging from 0 to 1500 cfs and a steady release at 2,000 cfs with estimated tidal basin inflows of 649 cfs. Model results from all scenarios predict daily salinity to be 0.5 or lower and the 30-day moving average surface salinity to be 0.3 at Val I-75 at the end of the two-week period (**Table ES-3 and Figure ES-10**). This keeps predicted salinities at Val I-75 within the LORS 2008 salinity range (0.0-5.0).

Red Tide

The Florida Fish and Wildlife Research Institute reported on October 1, 2021, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at very low to low concentrations in Charlotte County, and background to low concentrations in Lee County. On the east coast, red tide was not observed in samples from Palm Beach County.

¹ Qiu, C., and Y. Wan. 2013. Time series modeling and prediction of salinity in the Caloosahatchee River Estuary. *Water Resources Research* 49:5804-5816.

Water Management Recommendations

Lake stage is in the Low Sub-Band. Tributary conditions are Very Wet. The LORS2008 release guidance suggests up to 3,000 cfs release at S-79 to the Caloosahatchee River Estuary and up to 1170 cfs release at S-80 to the St. Lucie Estuary.

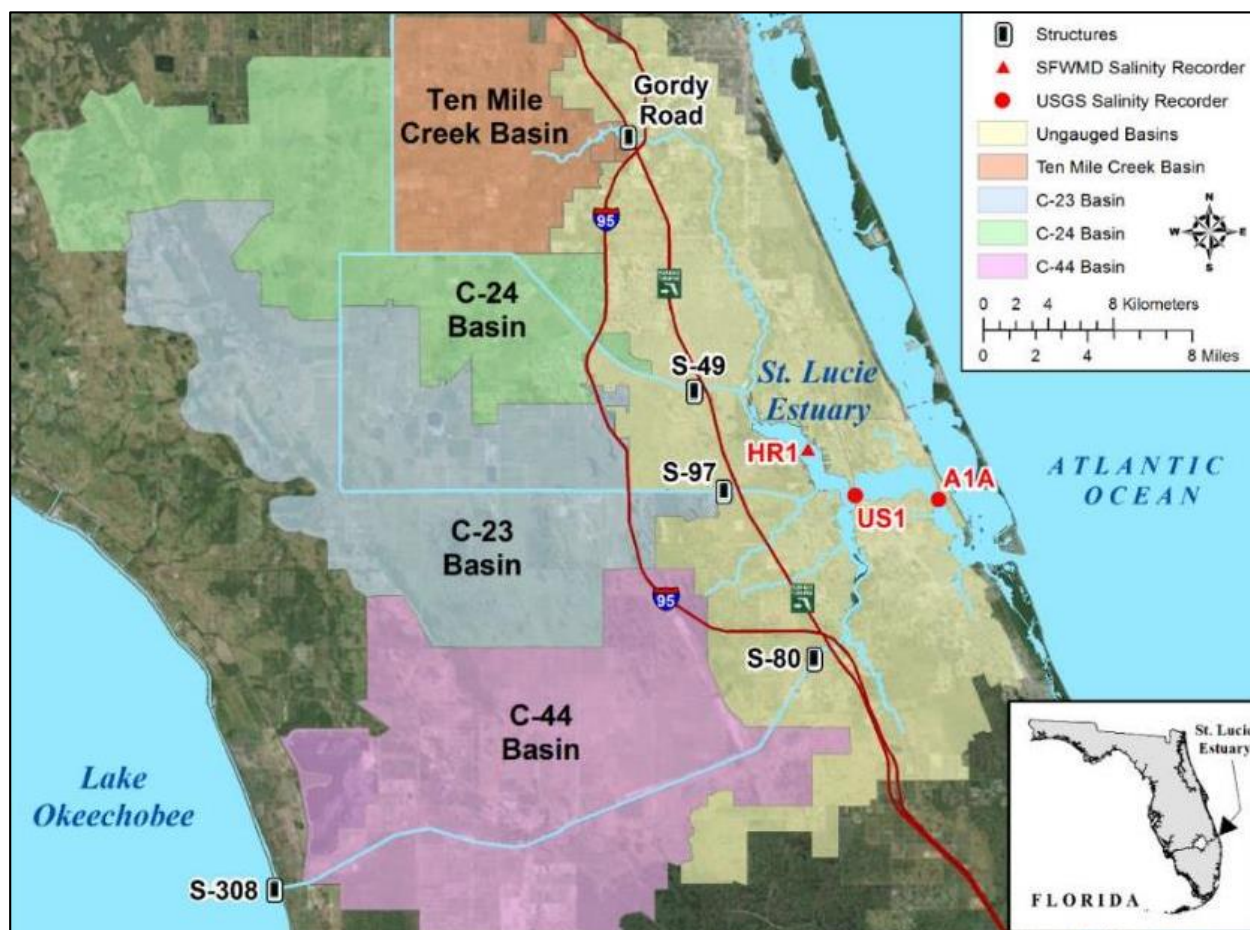


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

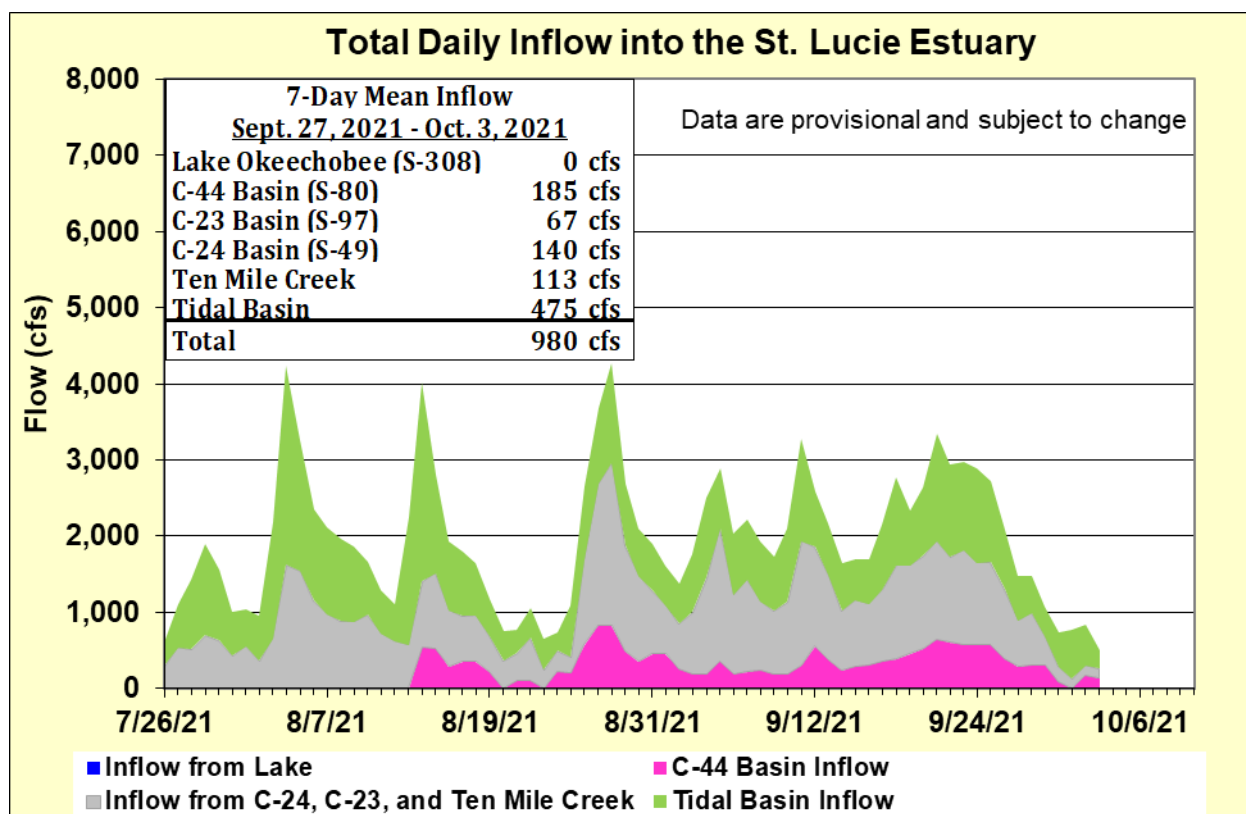


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

Table ES-1. Seven-day mean salinity at oyster monitoring sites in the St. Lucie Estuary. Current means are in bold font; previous week's means are in parentheses. The envelope reflects the preferred salinity range for adult eastern oysters (*Crassostrea virginica*) in the middle estuary. Data are provisional.

Sampling Site	Surface	Bottom	Envelope
HR1 (North Fork)	2.9 (2.0)	4.5 (5.4)	NA ^a
US1 Bridge	6.5 (6.1)	10.0 (8.5)	10.0 – 26.0
A1A Bridge	17.1 (14.4)	24.0 (22.1)	NA ^a

a. The envelope is not applicable.

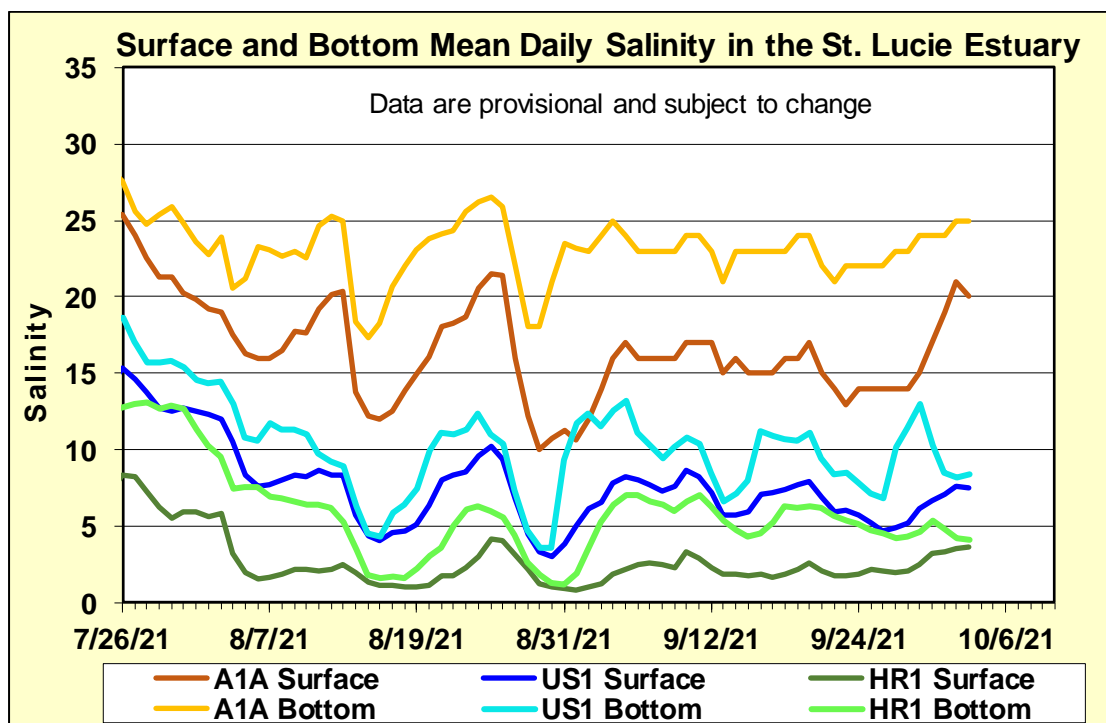


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

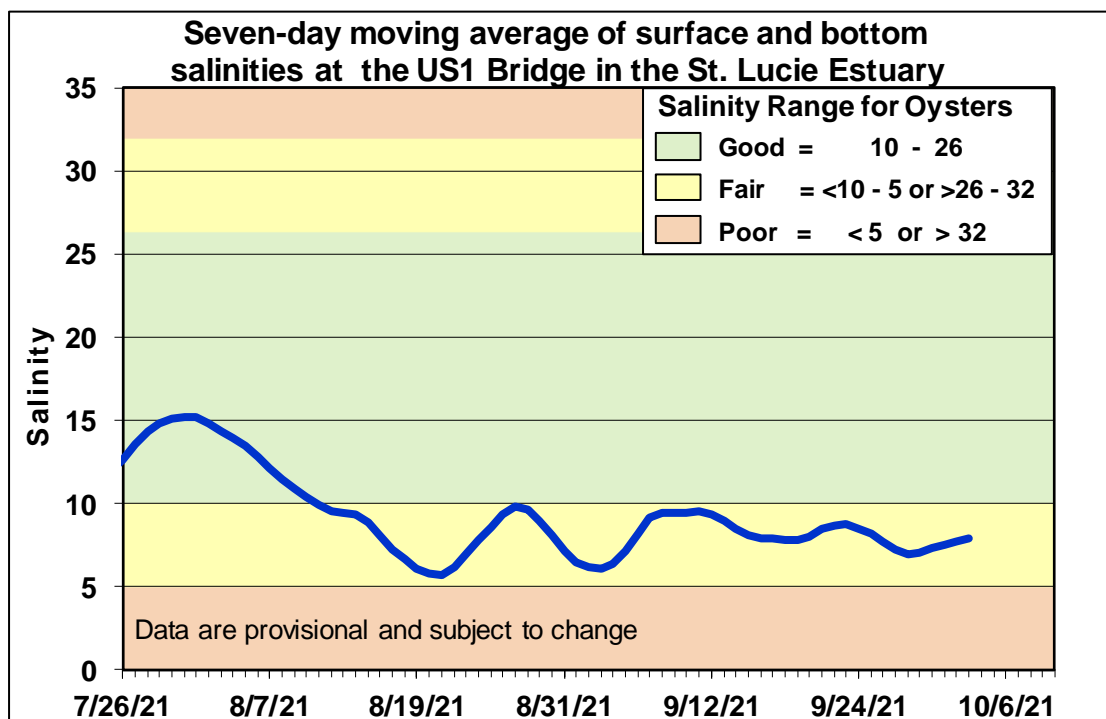


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

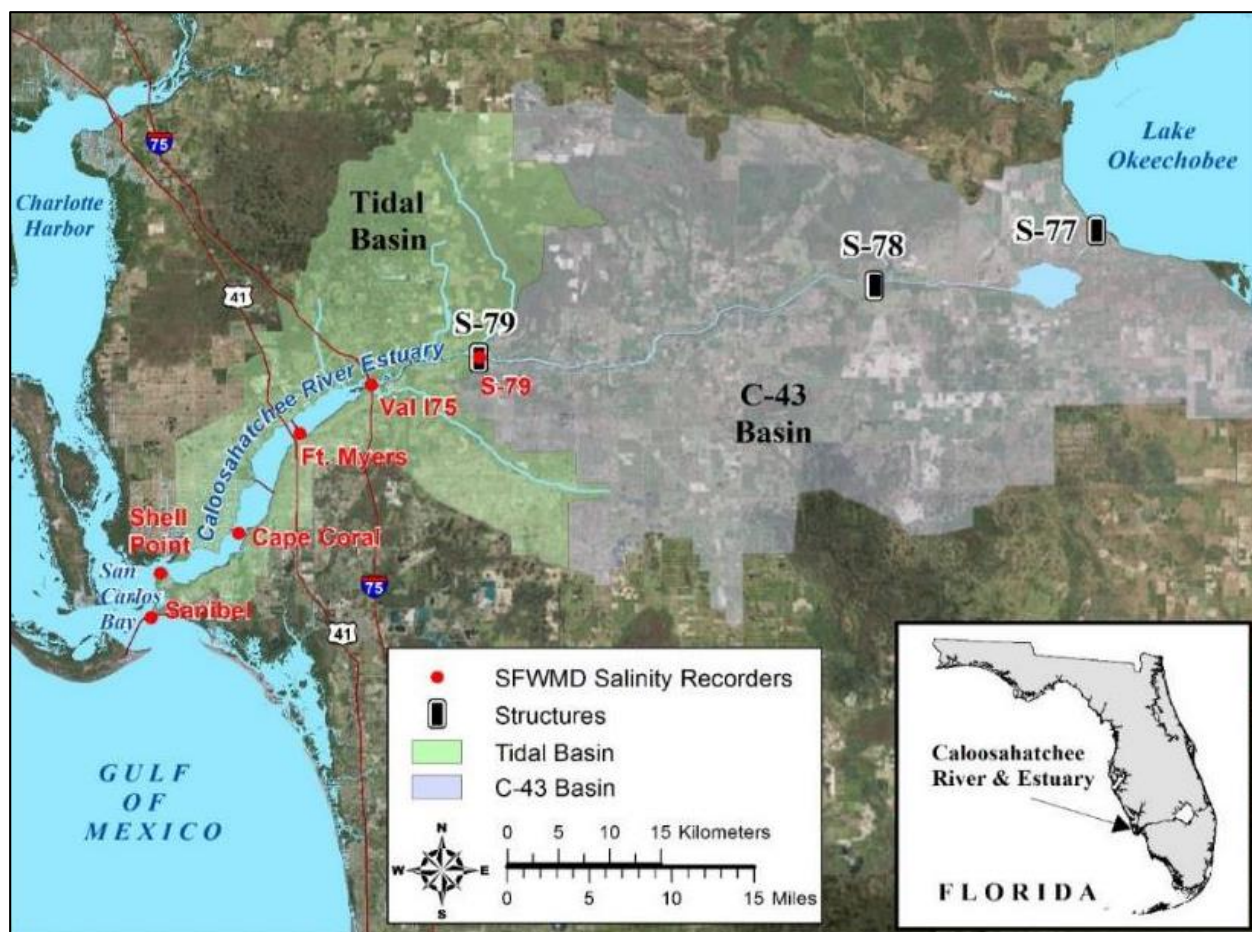


Figure ES-5. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

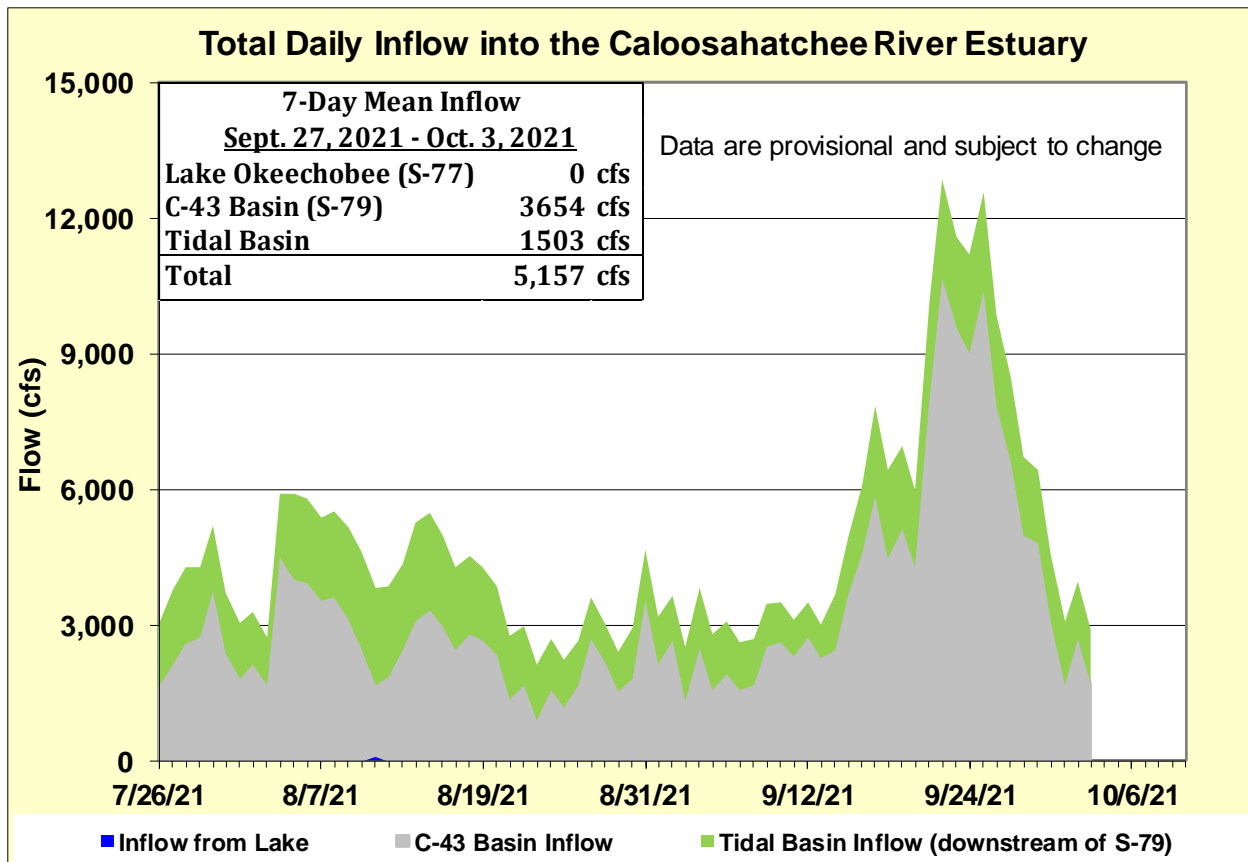


Figure ES-6. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

Table ES-2. Seven-day mean salinity at six monitoring sites in the Caloosahatchee River Estuary. Current means are in bold font; previous week's means are in parentheses. The envelope at I-75 is for the protection of tape grass in the upper estuary and the envelope in the lower estuary is the preferred salinity range for adult eastern oysters (*Crassostrea virginica*). Data are provisional.

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	0.2 (0.2)	0.2 (0.2)	NA ^a
Val I-75	0.2 (0.2)	0.2 (0.2)	0.0 – 5.0 ^b
Fort Myers Yacht Basin	0.2 (0.2)	0.2 (0.3)	NA ^a
Cape Coral	1.9 (0.6)	2.9 (0.7)	10.0 – 30.0
Shell Point	15.9 (10.7)	19.1 (13.7)	10.0 – 30.0
Sanibel	25.4 (22.5)	28.4 (24.3)	10.0 – 30.0

a. The envelope is not applicable.

b. The envelope is based on the predicted 30-day mean for the next two weeks.

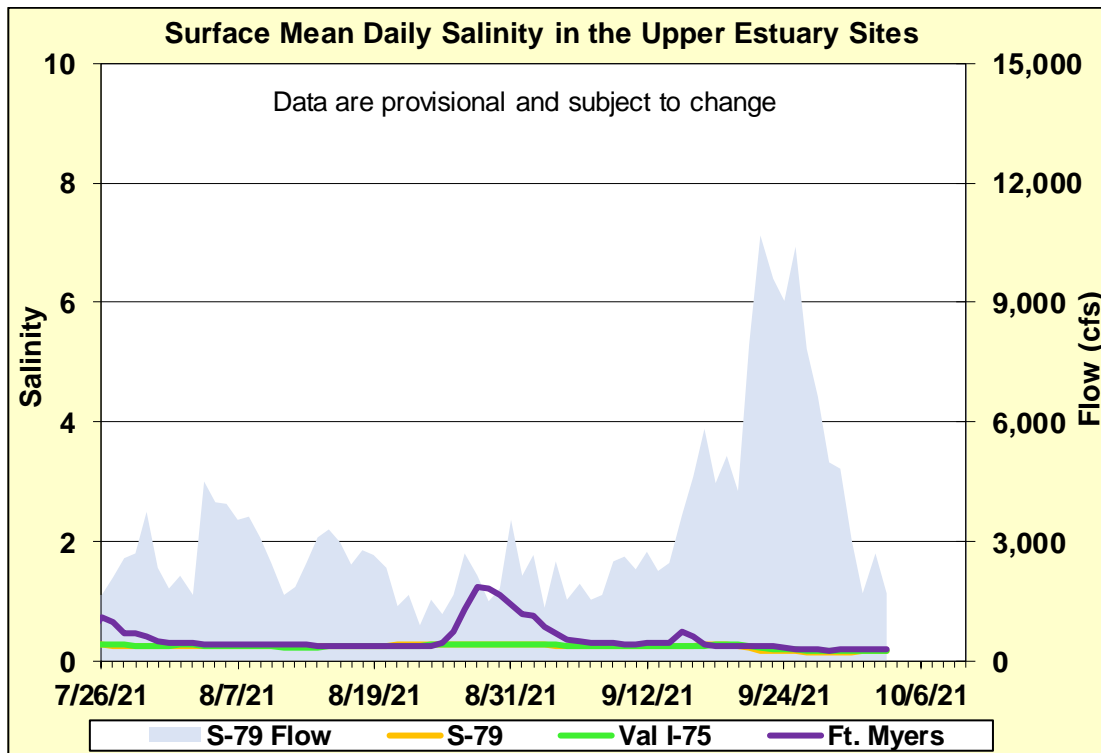


Figure ES-7. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

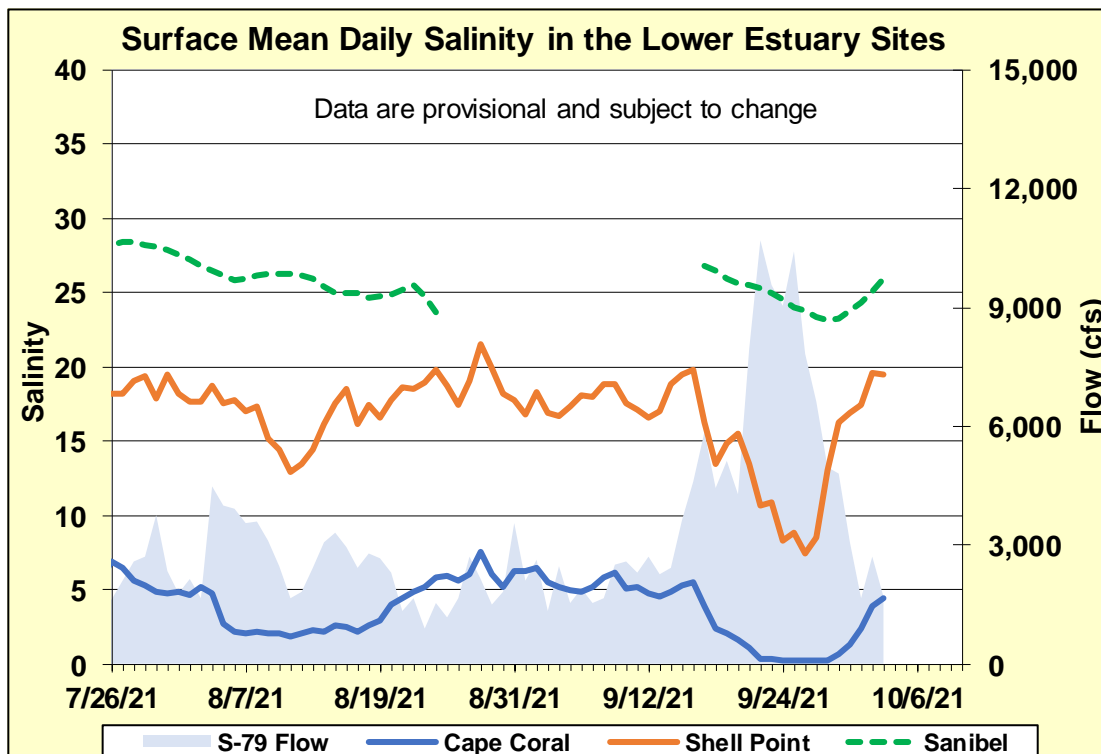


Figure ES-8. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

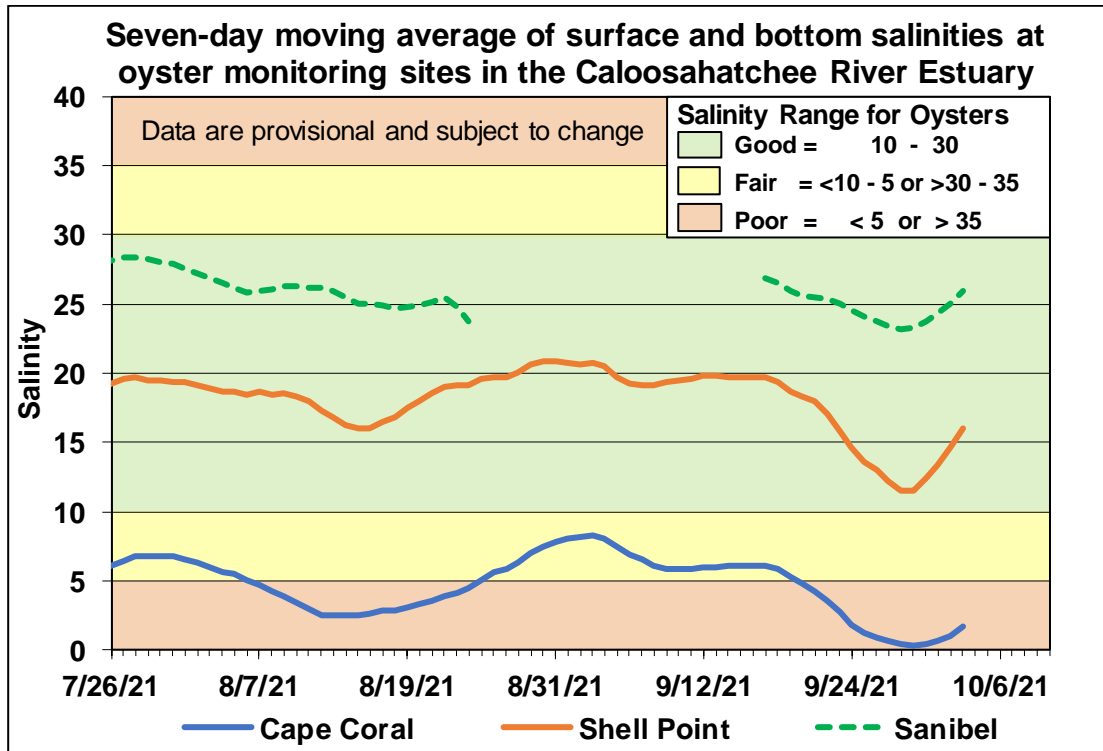


Figure ES-9. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

Table ES-3. Predicted salinity at Val I-75 in the Caloosahatchee River Estuary at the end of the forecast period for various S-79 flow release scenarios.

Scenario	Simulated S-79 Flow (cfs)	Tidal Basin Runoff (cfs)	Daily Salinity	30-Day Mean Salinity
A	0	649	0.5	0.3
B	450	649	0.3	0.3
C	800	649	0.3	0.3
D	1000	649	0.3	0.3
E	1500	649	0.3	0.3
F	2000	649	0.3	0.3

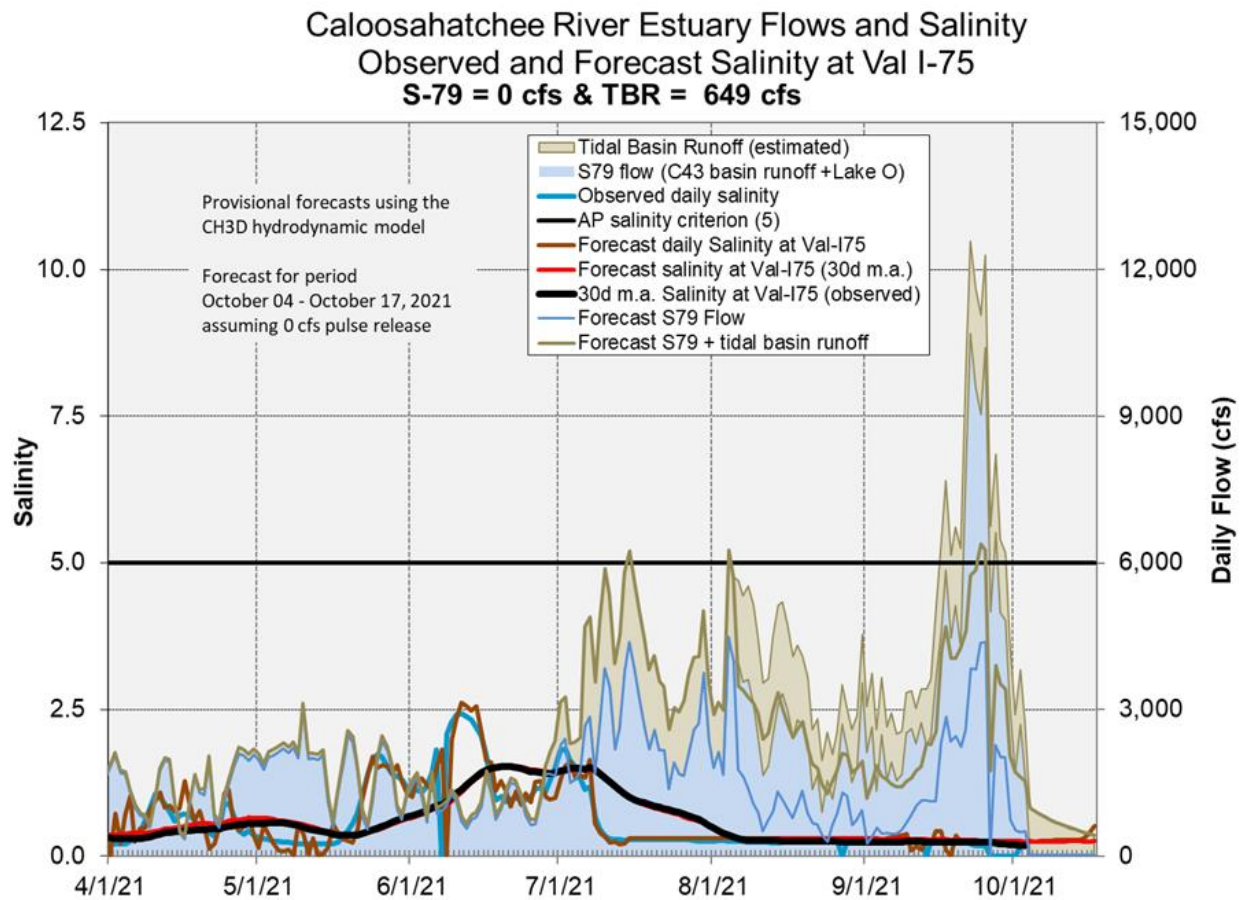


Figure ES-10. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7. Operational restrictions are in place in STA-1E Central Flow-way for vegetation management activities. Online treatment cells are above target stage and vegetation in these cells is stressed and highly stressed. The 365-day phosphorus loading rate (PLR) for the Eastern Flow-way is very high and for the Central Flow-way is extremely high (**Figure S-1**).

STA-1W: Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways due to construction activities. All treatment cells are near target stage. Vegetation in the flow-ways is stressed and highly stressed. The 365-day PLRs for the Northern and Western Flow-ways are below 1.0 g/m²/year. The 365-day PLR for the Eastern Flow-way is high (**Figure S-2**).

STA-2: STA-2 Flow-way 2 is offline for construction activities. Operational restrictions are in place in STA-2 Flow-ways 3 and 4 for vegetation management activities. Most treatment cells are above target stage. Vegetation in Flow-ways 1 and 3 is stressed, and in Flow-ways 2, 4 and 5 is highly stressed. The 365-day PLRs for Flow-ways 1, 4 and 5 are below 1.0 g/m²/year. The 365-day PLR for Flow-way 3 is high (**Figure S-3**).

STA-3/4: STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown. All online treatment cells are above target stage. Vegetation in the Eastern and Central Flow-ways is highly stressed and in the Western Flow-way is stressed. The 365-day PLR for the Western Flow-way is below 1.0 g/m²/year. The 365-day PLR for the Central Flow-way is high (**Figure S-4**).

STA-5/6: Operational restrictions are in place in STA-5/6 Flow-ways 2 and 3 following the Restoration Strategies project to grade non-effective treatment areas. Most treatment cells are above target stage. All treatment cells have highly stressed vegetation conditions except Flow-ways 7 and 8 which are healthy. The 365-day PLRs for most flow-ways are high (**Figure S-5** and **S-6**).

For definitions on STA operational language see glossary following figures.

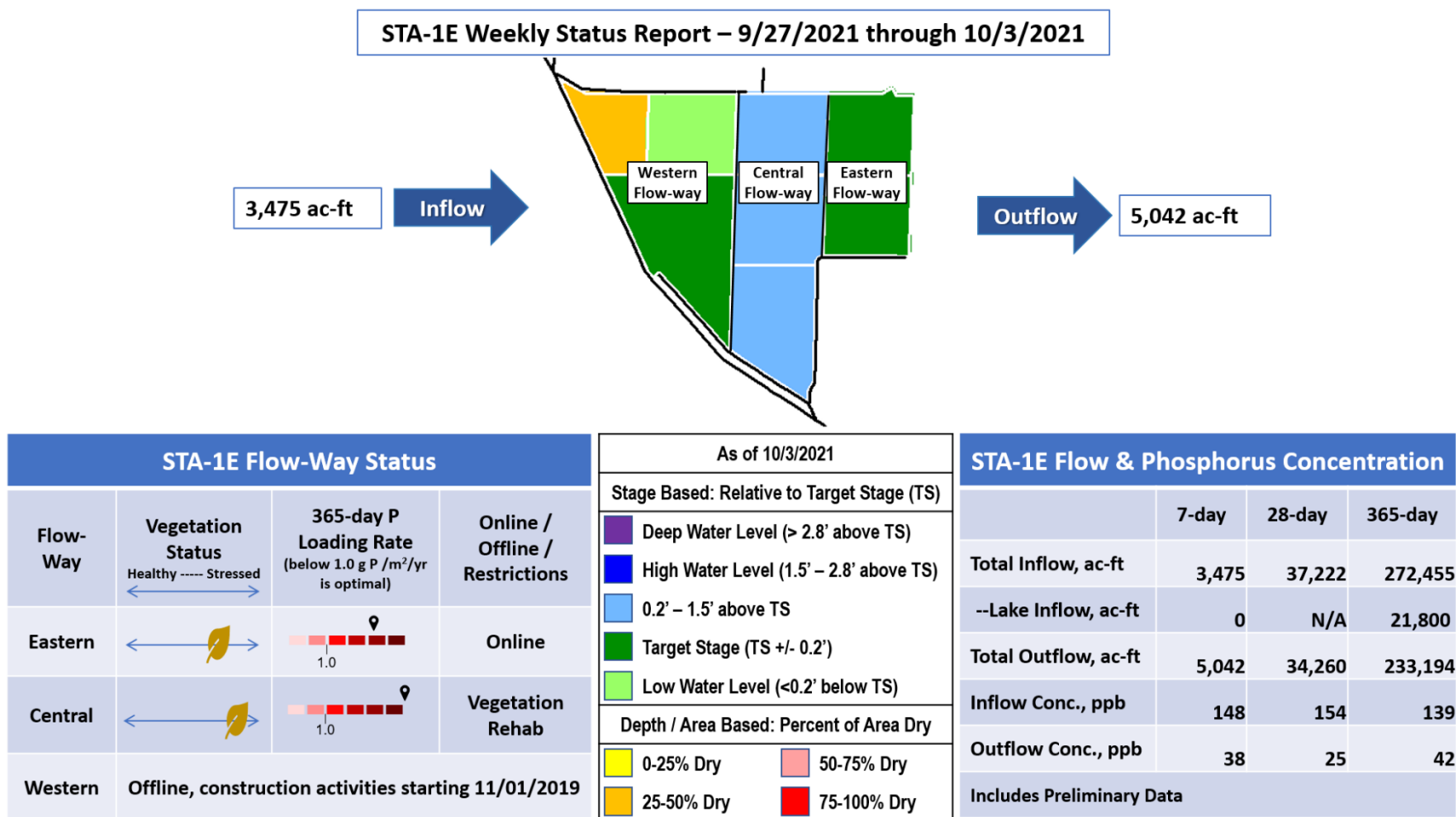
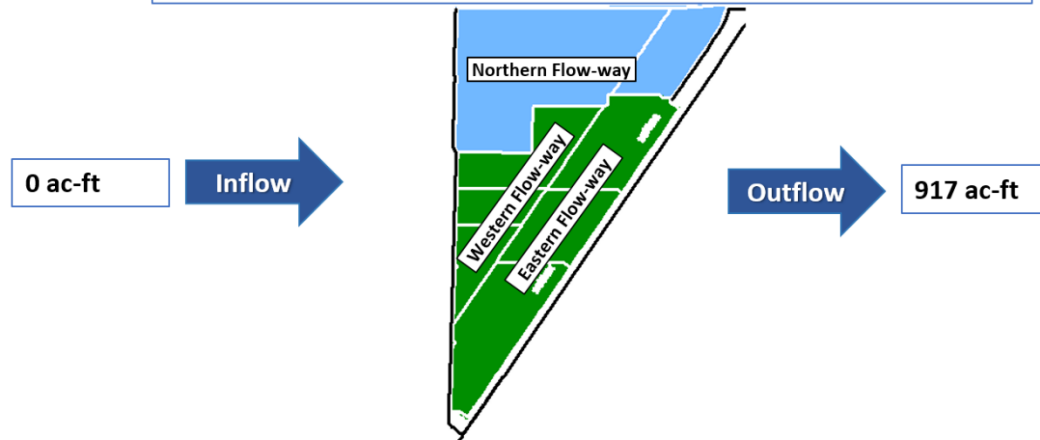


Figure S-1. STA-1E Weekly Status Report

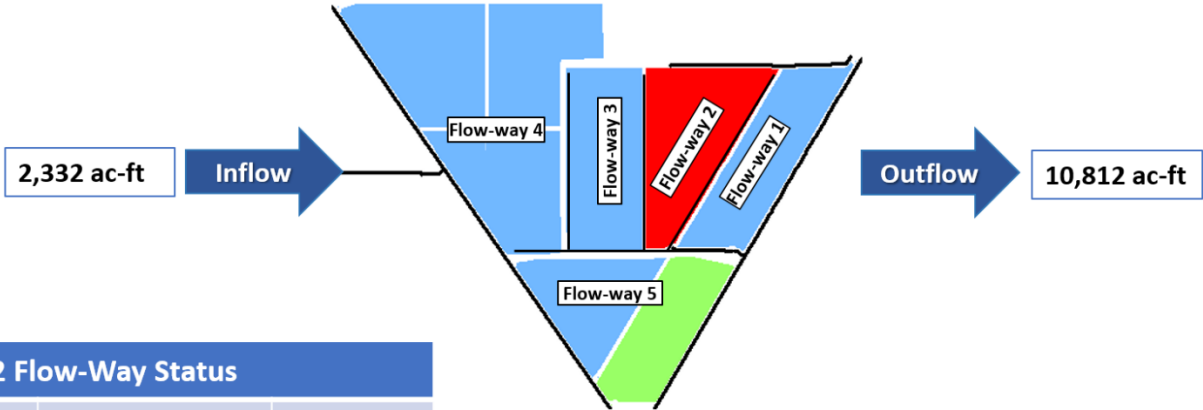
STA-1W Weekly Status Report – 9/27/2021 through 10/3/2021



STA-1W Flow-Way Status				As of 10/3/2021				STA-1W Flow & Phosphorus Concentration			
Flow-Way	Vegetation Status <small>Healthy --- Stressed</small>	365-day P Loading Rate <small>(below 1.0 g P /m²/yr is optimal)</small>	Online / Offline / Restrictions	Stage Based: Relative to Target Stage (TS)					7-day	28-day	365-day
				Deep Water Level (> 2.8' above TS)							
				High Water Level (1.5' – 2.8' above TS)							
				0.2' – 1.5' above TS							
				Target Stage (TS +/- 0.2')							
Low Water Level (<0.2' below TS)											
Depth / Area Based: Percent of Area Dry											
				0-25% Dry		50-75% Dry					
				25-50% Dry		75-100% Dry					
Northern			Construction					Total Inflow, ac-ft	0	2,368	97,834
Western			Construction					--Lake Inflow, ac-ft	0	N/A	6,600
Eastern			Construction					Total Outflow, ac-ft	917	5,656	109,218
								Inflow Conc., ppb	N/A	190	244
								Outflow Conc., ppb	24	23	42
								Includes Preliminary Data			

Figure S-2. STA-1W Weekly Status Report

STA-2 Weekly Status Report – 9/27/2021 through 10/3/2021



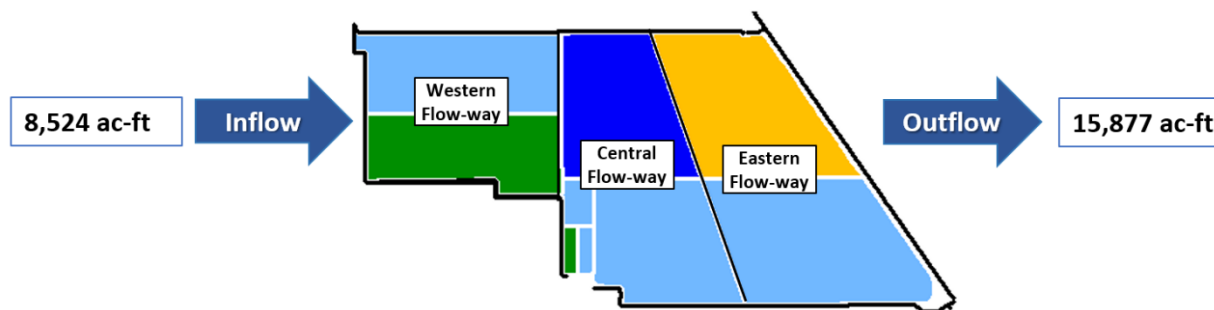
STA-2 Flow-Way Status			
Flow-Way	Vegetation Status Healthy ----- Stressed	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions
1			Online
2	Offline, construction activities as of 9/7/2021		
3			Vegetation Rehab
4			Vegetation Rehab
5			Online

As of 10/3/2021	
Stage Based: Relative to Target Stage (TS)	
	Deep Water Level (> 2.8' above TS)
	High Water Level (1.5' – 2.8' above TS)
	0.2' – 1.5' above TS
	Target Stage (TS +/- 0.2')
	Low Water Level (<0.2' below TS)
Depth / Area Based: Percent of Area Dry	
	0-25% Dry
	25-50% Dry
	50-75% Dry
	75-100% Dry

STA-2 Flow & Phosphorus Concentration			
	7-day	28-day	365-day
Total Inflow, ac-ft	2,332	54,121	411,198
--Lake Inflow, ac-ft	0	N/A	76,000
Total Outflow, ac-ft	10,812	60,532	448,633
Inflow Conc., ppb	102	111	93
Outflow Conc., ppb	15	15	19
Includes Preliminary Data			

Figure S-3. STA-2 Weekly Status Report

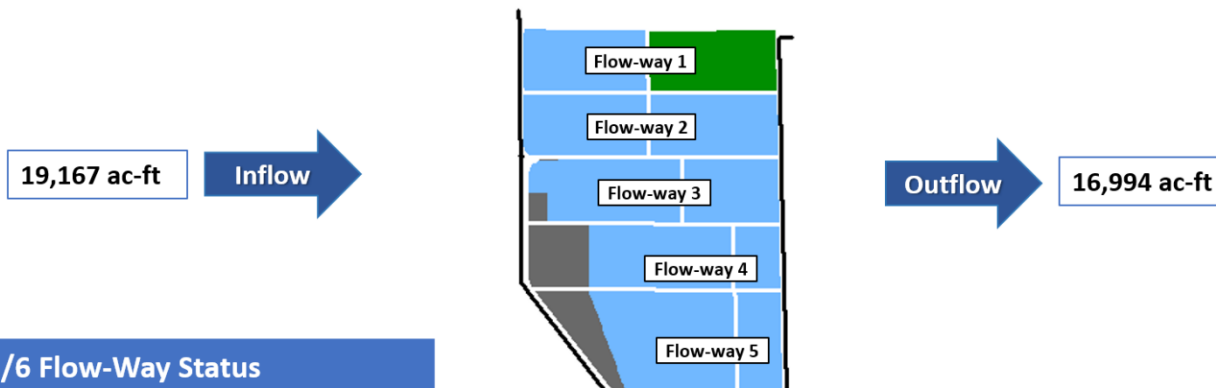
STA-3/4 Weekly Status Report – 9/27/2021 through 10/3/2021



STA-3/4 Flow-Way Status				As of 10/3/2021		STA-3/4 Flow & Phosphorus Concentration											
Flow-Way	Vegetation Status <div>Healthy ----- Stressed</div>	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions	Stage Based: Relative to Target Stage (TS)		Total Inflow, ac-ft	7-day	28-day	365-day								
				<div></div> Deep Water Level (> 2.8' above TS)													
				<div></div> High Water Level (1.5' – 2.8' above TS)													
				<div></div> 0.2' – 1.5' above TS													
				<div></div> Target Stage (TS +/- 0.2')													
				<div></div> Low Water Level (<0.2' below TS)													
				Depth / Area Based: Percent of Area Dry		Inflow Conc., ppb	96	76	68								
Eastern	Offline, vegetation management drawdown as of 3/1/2021			<div></div> 0-25% Dry	<div></div> 50-75% Dry					Outflow Conc., ppb	9	12	14				
				<div></div> 25-50% Dry	<div></div> 75-100% Dry												
Central	<div></div>	<div></div> <div>1.0</div>	Online	Includes Preliminary Data													
Western	<div></div>	<div></div> <div>1.0</div>	Online														

Figure S-4. STA-3/4 Weekly Status Report

STA-5/6 Weekly Status Report – 9/27/2021 through 10/3/2021



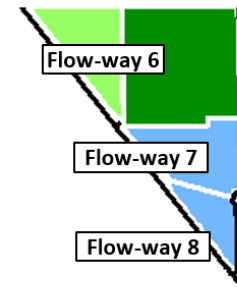
STA-5/6 Flow-Way Status			
Flow-Way	Vegetation Status Healthy ----- Stressed	365-day P Loading Rate (below 1.0 g P / m ² /yr is optimal)	Online / Offline / Restrictions
1	← →		Online
2	← →	N/A	Post-construction
3	← →	N/A	Post-construction
4	← →		Online
5	← →		Online



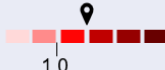

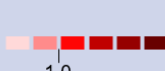

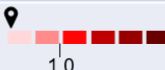
As of 10/3/2021	
Stage Based: Relative to Target Stage (TS)	
	Deep Water Level (> 2.8' above TS)
	High Water Level (1.5' – 2.8' above TS)
	0.2' – 1.5' above TS
	Target Stage (TS +/- 0.2')
	Low Water Level (<0.2' below TS)
Depth / Area Based: Percent of Area Dry	
	0-25% Dry
	25-50% Dry
	50-75% Dry
	75-100% Dry

STA-5/6 Flow & Phosphorus Concentration			
	7-day	28-day	365-day
Total Inflow, ac-ft	19,167	56,470	200,497
--Lake Inflow, ac-ft	0	N/A	9,000
Total Outflow, ac-ft	16,994	47,400	202,957
Inflow Conc., ppb	306	290	301
Outflow Conc., ppb	68	65	74
Includes Preliminary Data			

Figure S-5. STA-5/6 Weekly Status Report (Flow-ways 1 – 5)

STA-5/6 Weekly Status Report – 9/27/2021 through 10/3/2021



STA-5/6 Flow-Way Status			
Flow-Way	Vegetation Status Healthy ----- Stressed 	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
6			Online
7			Online
8			Online










As of 10/3/2021	
Stage Based: Relative to Target Stage (TS)	
	Deep Water Level (> 2.8' above TS)
	High Water Level (1.5' – 2.8' above TS)
	0.2' – 1.5' above TS
	Target Stage (TS +/- 0.2')
	Low Water Level (<0.2' below TS)
Depth / Area Based: Percent of Area Dry	
	0-25% Dry
	25-50% Dry
	50-75% Dry
	75-100% Dry

Figure S-6. STA-5/6 Weekly Status Report (Flow-ways 6 – 8)

Basic Concepts and Definitions for STA Weekly Status Report

- **Inflow:** Sum of flow volume at all inflow structures to an STA.
- **Lake Inflow:** Portion of the STA total inflow volume that originates from Lake Okeechobee.
- **Outflow:** Sum of flow volume at outflow structures from an STA.
- **Total Phosphorus (TP):** Total mass of phosphorus in all its forms; including particulate, dissolved, etc.
- **Inflow Concentration:** TP concentration is the mass of TP in micrograms per liter of water, $\mu\text{g/L}$ or ppb. Inflow concentration refers to the flow-weighted mean TP from all inflow structures over a period of time.
- **Outflow Concentration:** The flow-weighted mean TP from all outflow structures over a period of time. The outflow concentration represents the reduction of inflow TP achieved by STA treatment of the inflow water.
- **WQBEL:** The STA outflow concentration that is required upon completion of the Restoration Strategies projects by December 2025. The outflow concentration shall not exceed 13 ppb as an annual flow weighted mean in more than 3 out of 5 water years on a rolling basis and shall not exceed 19 ppb as an annual flow weighted in any water year.
- **Flow-Way (FW):** One or more treatment cells connected in series. Cells typically have emergent aquatic vegetation (EAV) in the front portion of the flow-way followed by a mix of EAV and submerged aquatic vegetation (SAV)
- **Vegetation Status:** Healthy means the vegetation condition is good and will allow the STA to perform as designed. Stressed means the vegetation is showing signs of poor health, such as browning or areas of vegetation die-off, or the cell contains undesirable vegetation such as floating exotic vegetation requiring treatment. The TP reduction capability of the STA is affected when the vegetation condition is poor.
- **Phosphorus Loading Rate (PLR):** Mass of inflow TP in grams, divided by total treatment area of STA in square meters, per year. In general, a 365-day value of less than 1.0 is needed for an STA to perform optimally. A PLR of 2.0 is considered very high and a PLR of 3.0 is considered extremely high. The TP reduction capability of the STA is affected when the PLR is high, very high and extremely high.
- **Online:** Online status means the FW can receive and treat inflow.
- **Online with Restriction:** The FW can receive and treat inflow, but the amount of flow or water level may be limited temporarily. For example, a vegetation rehabilitation effort may require reduced flows through an area while the new plants are establishing, or nesting by protected species may require a certain water level not to be exceeded.
- **Offline:** The FW is unable to receive and treat inflow due to repairs, construction, or other prohibitive reasons.
- **Depth:** Difference between the average surface water level in a cell and the average ground elevation in that cell. Target depths, or depths between flow events, are between 1.25 ft to 1.5 ft. As depth approaches or drops below zero, an increasing percentage of the cell is considered dry and STA conditions deteriorate. An increase in depth above target depth is expected with increasing flow. However, as depth increases much above the target depth and is sustained over a period of time, it can be detrimental to vegetation health and overall STA treatment performance.
- **Note:** The data provided in this summary report were developed using a combination of provisional and quality-assured flow and water quality data. In some cases, best professional judgment was used to estimate missing data and revise questionable data. Values provided are not considered final but are appropriate for use in STA operational decision-making.

Everglades

Water Conservation Area Regulation Schedules

WCA-1: The Three-gauge average stages continues to follow just below the Zone A1 regulation line last week, the average on Sunday remained 0.21 feet below that line.

WCA-2A: Stage at 2A-17 continue to rise then peaked late in the week, the average on Sunday was 1.23 feet higher than the Zone A regulation line.

WCA-3A: The Three Gauge Average stage fell slightly towards the Zone A regulation line last week. Stage averaged 0.05 feet above the rising schedule line on Sunday. WCA-3A: Stage at gauge 62 (Northwest corner) dropped slowly last week. The average on Sunday was 0.52 feet below the flat Upper Schedule. (**Figures EV-1 through EV-4**).

Water Depths

The WDAT tool indicates that water depths in WCA-3A North have reached the surface across the entire sub-basin. The upper reaches of the L-67s depths exceeding 3.5 feet. Depths are between 1.0 – 1.5 feet across northern WCA-2A, and vegetation conditions within the marsh were recently surveyed in the field and little stress was found. North to South hydrologic connectivity remains within Everglades National Park (ENP) sloughs, building within the eastern sloughs. (**Figure EV-5**). Comparing WDAT water levels from present over the last month, stages generally increased, most significantly in southern WCA-2A. Looking back one year ago, WCA-2A is again significantly wetter in the south, and BCNP in the west. Eastern WCA-3A is significantly drier (**Figure EV-6**). Compared to the 20-year median water depths, most of the central Everglades again moved closer to the median last week. The western sloughs in ENP are below average; while WCA-1, -2A and eastern ENP are significantly above average. (**Figure EV-7**).

Taylor Slough and Florida Bay

An average of 0.65 inches of rain fell over Taylor Slough and Florida Bay over the week ending Sunday (10/3) and stage decreased an average of 0.08 feet over the week with all stations showing a decrease and the largest decrease in the central Slough area (**Figure EV-8**). The smallest weekly decrease was in the area west of the S332D detention area (E112). The TSB station showed a slight increase towards the end of the week, but it did not overcome the initial decrease (**Figure EV-9**). The southern areas are average and the northern area is 5 inches above average while the Slough as a whole is 2.3 inches above the historical average for this time of year. It should be noted that Northern Taylor Slough historical averages are from before the alterations to the system to facilitate water movement and that this area is expected to be higher than the historical average as a result.

Salinities in Florida Bay averaged no change over the week ending 10/3, but individual stations had weekly changes ranging from -4.2 to +4.1 (**Figure EV-8**). The largest weekly increase occurred in the western nearshore area (GB) returning that station to a marine condition. Both the central and western areas are now above their respective 75th percentiles (**Figure EV-10**). More freshwater is still needed to push the estuarine

front out into the Bay before the dry season begins. Most of the Bay is still marine or higher and is 6 higher than the historical average for this time of year.

Water Management Recommendations

Ascension rates that do not exceed 0.25 feet per week or 0.50 feet per two weeks are considered ecologically healthy. Conserving water in the northern basins, then allowing that water to move downstream maximizes the ecological benefit of freshwater flow. Flows into northern WCA-3A that move downstream continue to have an ecological benefit. Continued freshwater into Florida Bay will push the estuarine front further into the Bay. Individual regional recommendations can be found in **Table EV-2**.

Table EV-2. Previous week's rainfall and water depth changes in Everglades regions.

Everglades Region	Rainfall (inches)	Stage change (feet)
WCA-1	0.45	-0.02
WCA-2A	1.06	+0.12
WCA-2B	1.02	+0.34
WCA-3A	0.23	-0.06
WCA-3B	0.43	-0.04
ENP	0.40	+0.01

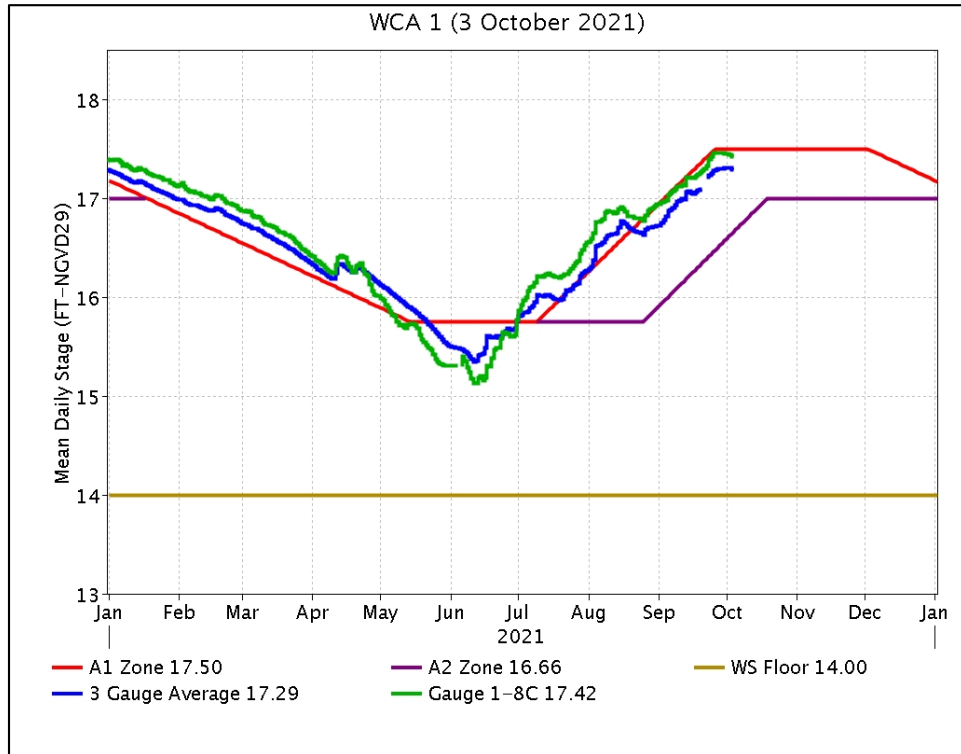


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

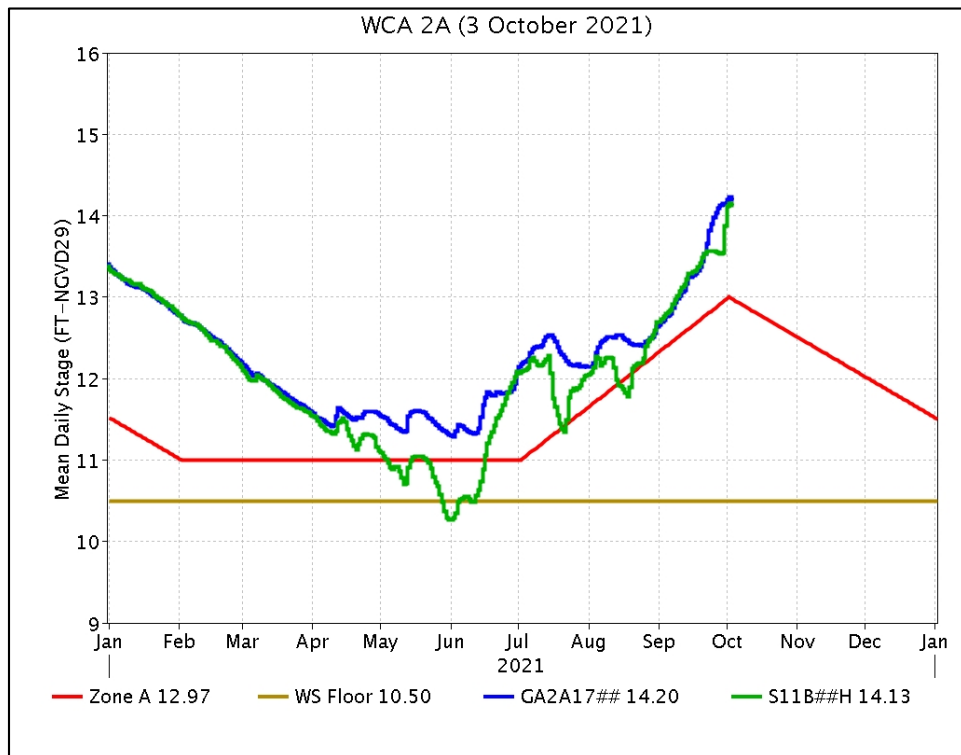


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

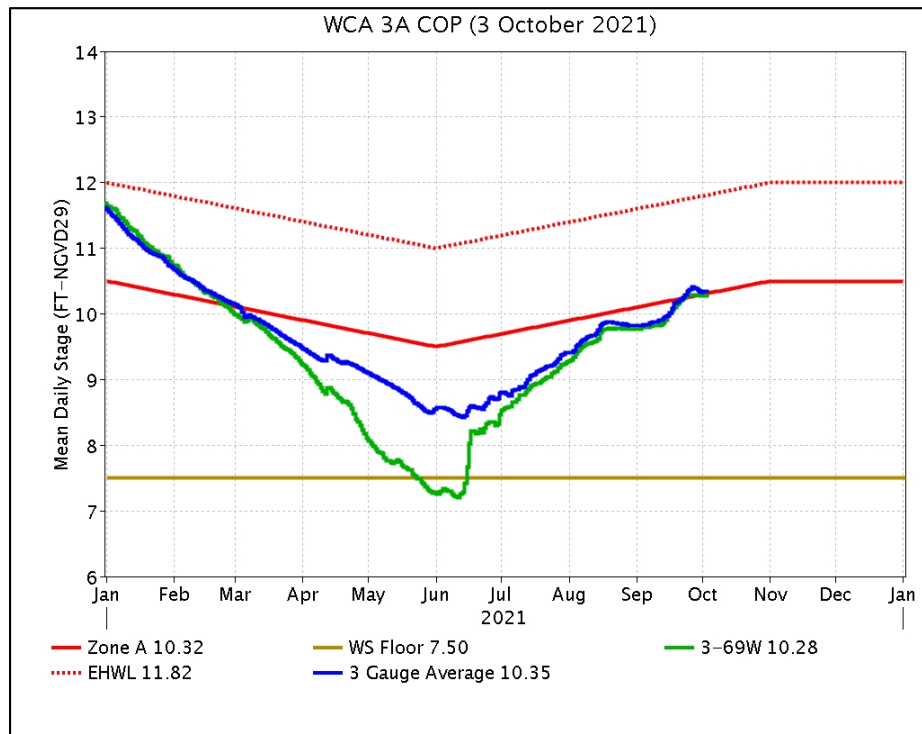


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

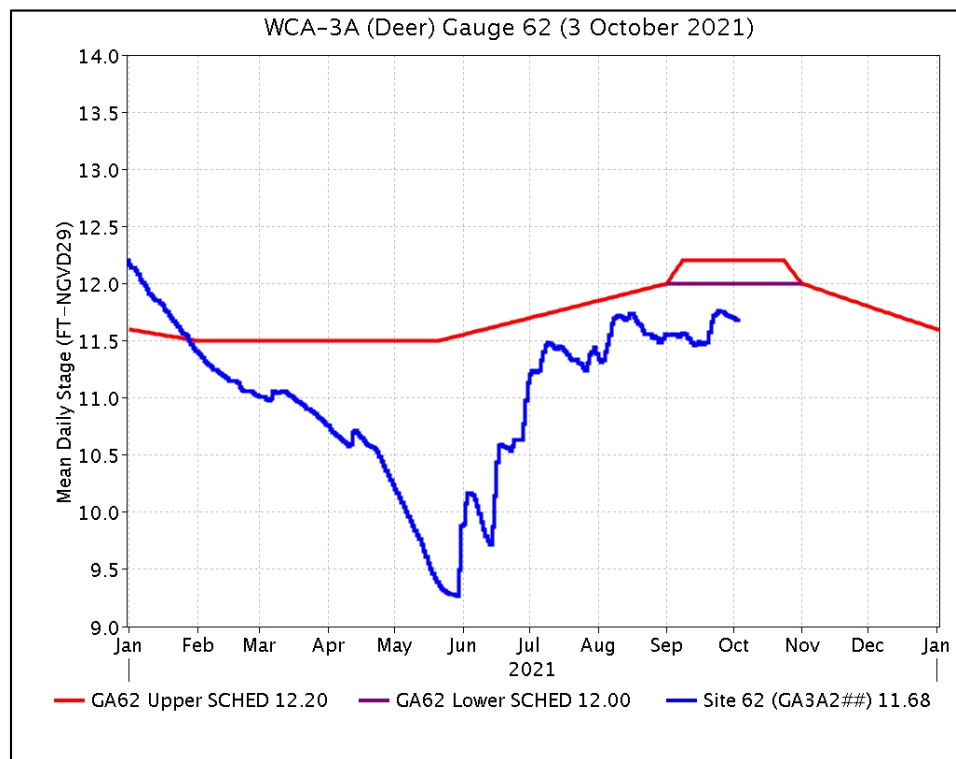


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

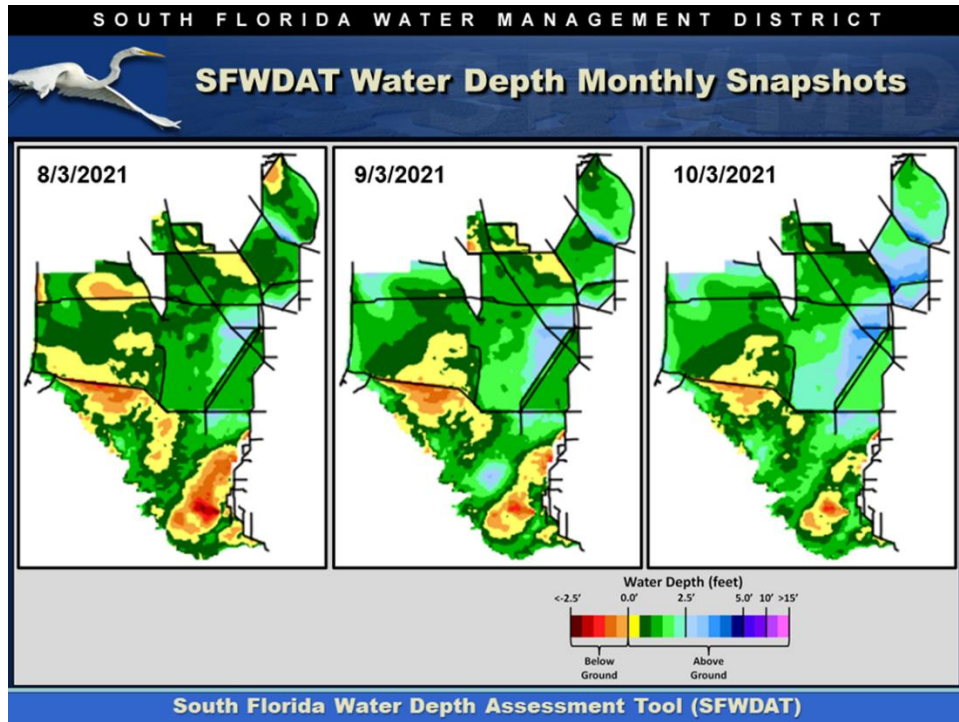


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

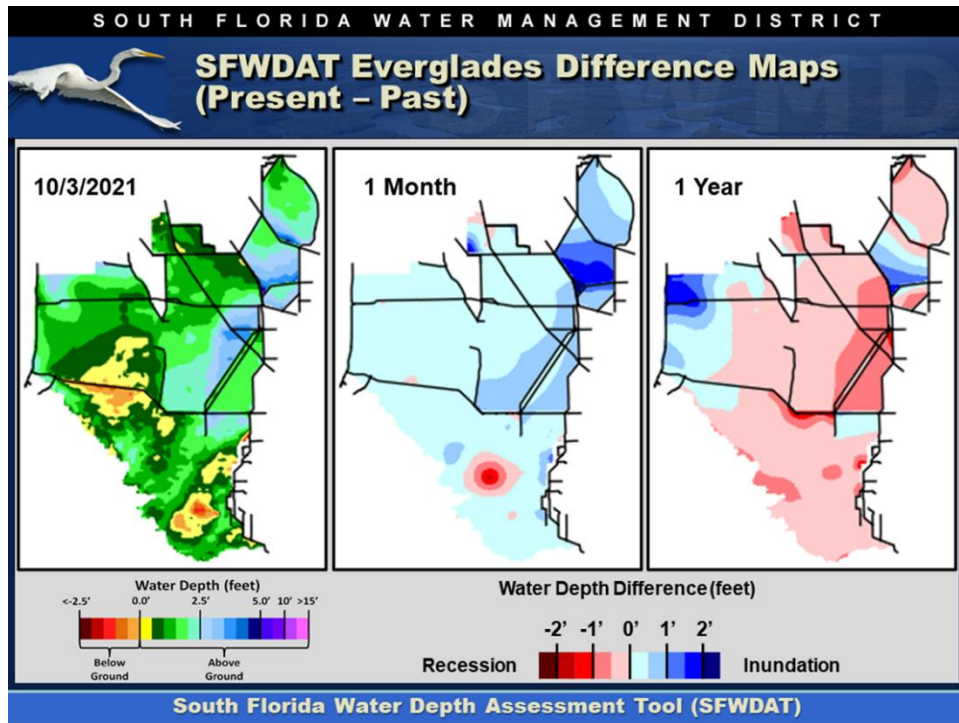


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

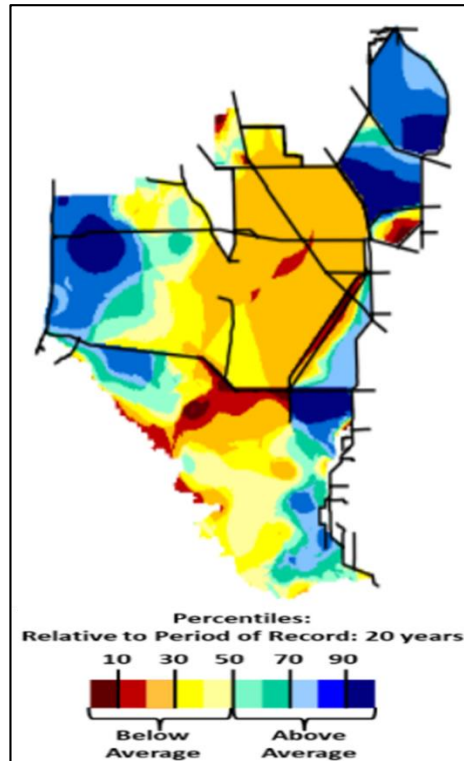


Figure EV-7. Present water depths compared to the day of year median over the previous 20 years.

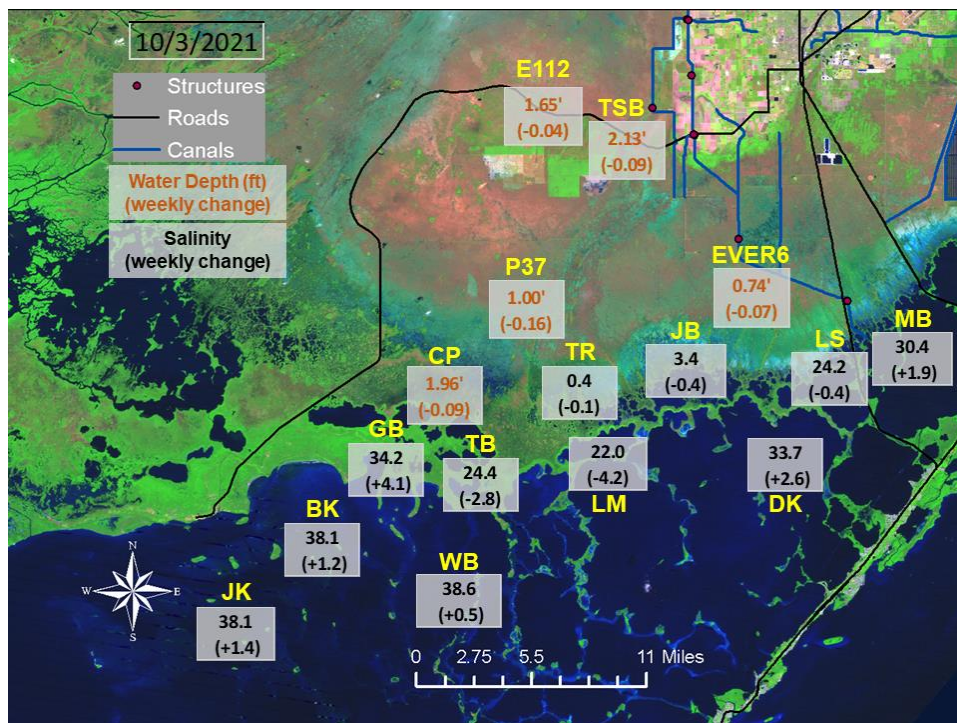


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

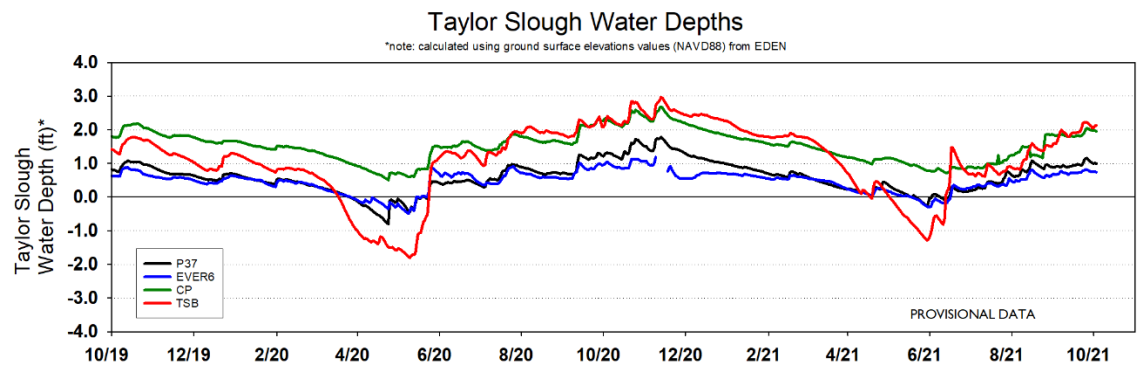


Figure EV-9. Taylor Slough water depth time series.

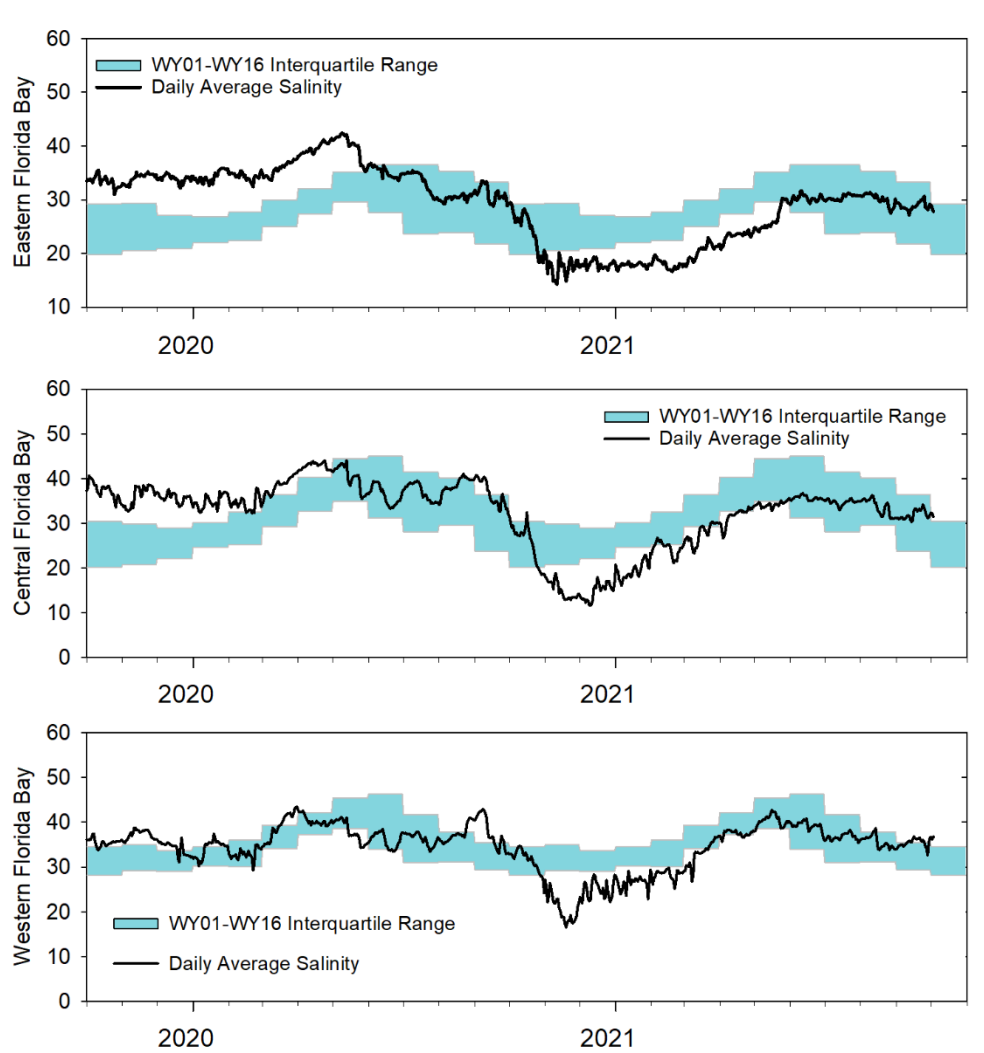


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

Table EV-2. Weekly water depth changes and water management recommendations

SFWMD Everglades Ecological Recommendations, October 5 th , 2021 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.02'	Maintain stages along regulation line, moderating any ascension to less than 0.25' per week while moving water south.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage increased by 0.12'	Maintain stages above the regulation line, moderating any ascension to less than 0.25'.	Protect within basin habitat and wildlife. Maintaining stage above 13.75 until November 1 st has ecological benefit.
WCA-2B	Stage increased by 0.34'	Moderate ascension rates to less than 0.25' feet per week or 0.50' feet per two weeks.	Protect within basin habitat and wildlife.
WCA-3A NE	Stage increased by 0.03'	Maintain an ascension rates of less than 0.25' feet per week or 0.50' feet per two weeks.	Protect within basin peat soils and downstream habitat and wildlife.
WCA-3A NW	Stage decreased by 0.03'	Initiate an ascension rates of less than 0.25' feet per week or 0.50' feet per two weeks.	
Central WCA-3A S	Stage decreased by 0.03'	Initiate an ascension rate to less than 0.25' feet per two weeks, while moving water through the system.	Protect within basin and downstream habitat and wildlife.
Southern WCA-3A S	Stage decreased by 0.19'		
WCA-3B	Stage increased by 0.04'	Maintain the ascension rates to less than 0.50 feet per two weeks.	Protect within basin and downstream habitat and wildlife.
ENP-SRS	Stage changes ranged from -0.04' to -0.16'	Make discharges to the Park according to COP and TTFF protocol while considering upstream and downstream ecological conditions.	Protect within basin and upstream habitat and wildlife.
Taylor Slough	Salinity changes ranged -4.2 to +4.1	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged -4.7 to +0.8	Move water southward as possible.	When available, provide freshwater to maintain low salinity buffer and promote water movement.